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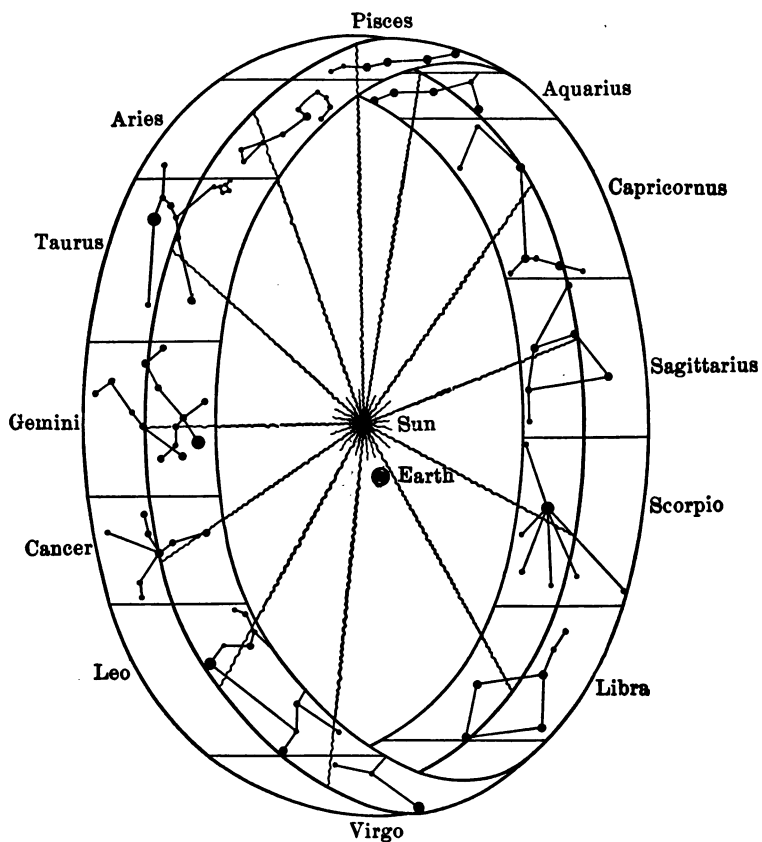
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“ Why did not somebody teach me the constellations, and make me at home in the starry heavens, which are always overhead, and which I don't half know to this day?”

—THOMAS CARLYLE.

BAND OF THE ZODIAC



When the Sun is in Aries

416.00

THE STARS AND THEIR STORIES

A Book for Young People

WLC

PREPARED BY
ALICE MARY MATLOCK GRIFFITH

WITH PEN SKETCHES BY
MARGARET BOROUGHS
AND OTHER ILLUSTRATIONS



NEW YORK
HENRY HOLT AND COMPANY

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PREFACE

My purpose here is to interest the child in the stars, which are always with him; to stimulate his imagination; and to direct him in a pastime—the hunting out of the constellations and individual stars—that may become an enduring joy.

With the help of the oblong charts and their duplicates, in which Miss Borroughs has placed the animals, he can learn the constellations separately and in groups, with the ancient mythic animals in their places; and by using the round charts at the back of the book, he can see the sky as a whole, as it appears from our Northern Hemisphere during the different seasons, and trace out the smaller or less important constellations which I have not given. A good way to learn the configurations that form the constellations is to draw them. If the charts are held over the head, with the cardinal points in the proper places, the stars can be seen as they are in the sky; or the same result can be obtained by one who sits facing the south and holds the charts with the north end upwards.

If any child has as much pleasure in reading this book as I have had in preparing it, or obtains a broader outlook upon life from its perusal, all my efforts will be fully repaid.

A. M. M. G.

Women in Astronomy Collection

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THE STARS AND THEIR STORIES

THE VOLUME ÓF THE SKIES

When I survey the bright
Celestial sphere,
So rich with jewels hung, that night
Doth like an Ethiop bride appear;
My soul her wings doth spread,
And heavenward flies,
The Almighty's mysteries to read
In the large volumes of the skies.

—WILLIAM HABINGTON.

MY STAR

All that I know
Of a certain star
Is, it can throw
(Like the angled spar)
Now a dart of red,
Now a dart of blue;
Till my friends have said
They would fain see, too,
My star that dartles the red and the blue!
Then it stops like a bird; like a flower, hangs furled:
They must solace themselves with the Saturn above it.
What matter to me if their star is a world?
Mine has opened its soul to me; therefore I love it.

—BROWNING.



DANCE OF THE PLEIADES
(From the painting by Ellhu Vedder)

THE STARS AND THEIR STORIES

Silently one by one, in the infinite meadows of heaven,
Blossomed the lovely stars, the forget-me-nots of the angels.

—LONGFELLOW: *Evangeline*.

THE stars that twinkle so beautifully on any clear night, and that look so small, are really all of them great suns like our own. Most of them, in fact, are larger than our sun. If they were not, we could not see them, they are so far away from us. If you could stand on the nearest fixed star, and look back to our sun, you would see it as one of the very smallest of all the stars. And then this Earth, that seems so big to us, and Venus, and Mars, and Jupiter, and the other planets, you could not see at all. It is possible, indeed it is almost probable, that every star has a family of planets about it, just as our sun has; perhaps, too, the light and heat it sends out nourish life on its planets, just as the light and heat of our sun make possible the life around us here on the Earth.

From the beginning, men have looked at the stars, and wondered what they are and what they mean. Are they scattered about in haphazard fashion, without any order at all? So far as we have yet been able to learn, they really are. But if you will watch a little while, you will see that the brighter ones seem to be grouped together, so that you can make pictures with them. On the plains of Asia, or in rainless Egypt, cen-

turies before Christ—nobody knows just when—men began to see such pictures in the heavens. As they saw these pictures, they began to tell stories of how they came to be up there. Each picture, as they saw it, is called a constellation, which simply means a cluster of stars; and each story has for its hero some king or demigod, some beast or bird, who, it was supposed, was, after his death, transported to the sky and changed to a group of stars, to remind men of all times of his glory and his achievements.

Of course, to you and me, there is nothing real about the figures they saw; it is only in our imaginations that we can see the Lion, the Swan, and the others. Yet we ought to learn to recognize the constellations, in order to be able to find our way among the stars. It is an easy matter to learn them, and to be able to recognize them whenever we see them. To be sure, not all the stars can be seen at any one time. Some of them go down in the west as others rise in the east. And, indeed, if you will watch at the same hour for three or four weeks in succession, you will observe that the sky changes slightly from night to night. But by noting them through the seasons, we can, in the course of a year, see all but those so far to the south that they appear only to people living near the equator, or on the other side of it. And as we look upon the constellations in their procession, each will remind us of its own story.

Not only the stories told in the long ago are interesting. Those told by modern men of science, though of a very different kind, are quite as interesting. These latter-day stories tell the adventures, not of earth-born heroes who were changed into stars, but of the stars

themselves, what they are made of, and how they move among their celestial neighbors.

In the pages that follow you will find charts that will enable you to identify the constellations quite readily for yourself. You will also find stories of both kinds, those of the ages long ago, told under summer sky, or beside winter fire, to explain the constellations that men noticed then, even as you and I still see them; and those that the astronomers of to-day tell us, after they have scanned the face of the heavens with the instruments they have invented to aid them. And, finally, you will read verses into which the poets have woven their thoughts of the stars and their stories.

THE SONG OF THE STARS

WHEN the radiant morn of creation broke,
And the world in the smile of God awoke,
And the empty realms of darkness and death
Were moved through their depths by his mighty breath,
And orbs of beauty and spheres of flame
From the void abyss by myriads came—
In the joy of youth as they darted away,
Through the widening wastes of space to play,
Their silver voices in chorus rang,
And this was the song the bright ones sang:

“ Away, away, through the wide, wide sky,
The fair blue fields that before us lie—
Each sun with the worlds that round him roll,
Each planet, poised on her turning pole;
With her isles of green, and her clouds of white,
And her waters that lie like fluid light.

“ For the source of glory uncovers his face,
And the brightness o’erflows unbounded space,
And we drink as we go to the luminous tides
In our ruddy air and our blooming sides:
Lo, yonder the living splendors play;
Away, on our joyous path, away!

“ Look, look, through our glittering ranks afar,
In the infinite azure, star after star,
How they brighten and bloom as they swiftly pass!
How the verdure runs o’er each rolling mass!
And the path of the gentle winds is seen,
Where the small waves dance, and the young woods lean.

“ And see, where the brighter day-beams pour,
How the rainbows hang in the sunny shower;
And the morn and eve, with their pomp of hues,
Shift o’er the bright planets and shed their dews;
And ’twixt them both, o’er the teeming ground,
With her shadowy cone the night goes round!

“ Away, away! in our blossoming bowers,
In the soft airs wrapping these spheres of ours,
In the seas and fountains that shine with morn,
See, Love is brooding, and Life is born,
And breathing myriads are breaking from night,
To rejoice, like us, in motion and light.

“ Glide on in your beauty, ye youthful spheres,
To weave the dance that measures the years;
Glide on, in the glory and gladness sent
To the furthest wall of the firmament—
The boundless visible smile of Him
To the veil of whose brow your lamps are dim.”

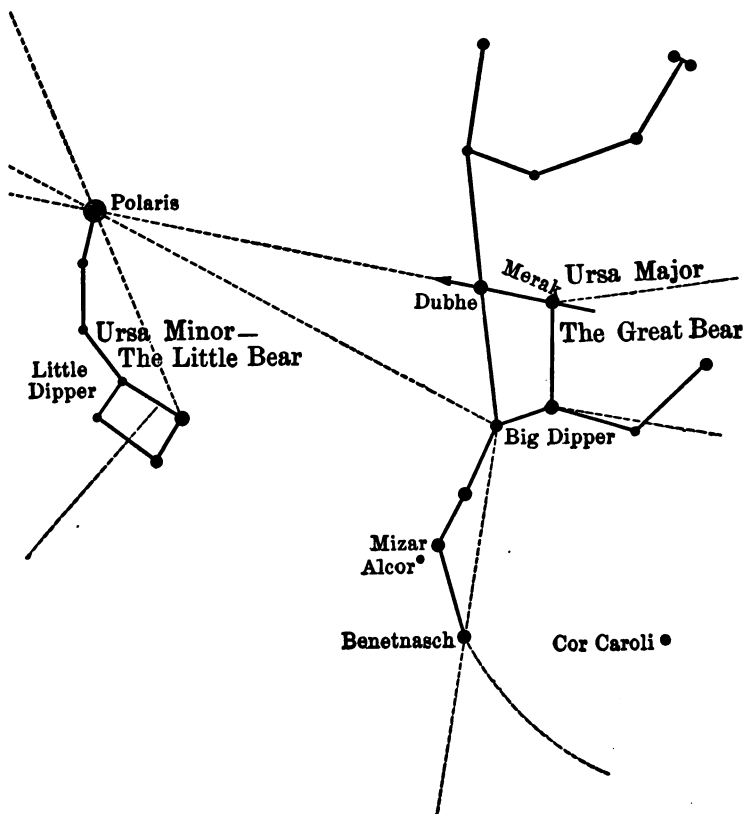
—WILLIAM CULLEN BRYANT.

THE TWO BEARS

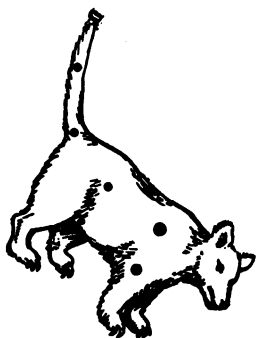
URSA MAJOR AND URSA MINOR

These two constellations whirl so closely to the pole that in our northern latitudes we do not see them set. Each has a group of stars resembling a dipper; and so they are often called the Big Dipper and the Little Dipper.

In the ancient pictures of the Great Bear the legs are much longer than shown here; the two hind legs stretch away to the Lesser Lion, and the left front paw touches the two stars that lie just in front of it here; consequently the figure with its long tail and long legs has small likeness to a bear.



MBurgke



**Onward the kindred Bears with footsteps rude
Dance 'round the pole, pursuing and pursued.**

THE TWO BEARS

CALLISTO AND ARCAS

THE Greeks, if we are to judge from their stories, evidently felt that the friendship of the gods was as likely to bring trouble as their enmity. It proved so in the hard experience of Callisto. She was a beautiful maiden whom Jupiter saw and admired. He showed her many a favor, and visited her often; but he endeavored to keep his visits a secret from his wife, Juno, for she was jealous-hearted. The goddess, however, learned of the friendship, and she made up her mind to take a severe revenge upon the human maiden.

Callisto had a baby boy, but not even the love of her son could keep her from going a-hunting. While Callisto was eagerly following the chase one day, she had the bad luck to meet Juno. Now, Juno was the most majestic of all the goddesses, as, to be sure, was entirely befitting in the Queen of Olympus. The mere sight of her must have inspired awe in Callisto. And when the poor lady saw the divine eyebrows straighten into the severity of a frown, and the regal, dark eyes, that Homer loves to describe, glow with the fires of jealousy, she must have felt terror as well as awe. Poor, poor creature, her days of happiness were done. With never a pang of pity, the goddess commanded that she change from a woman to a bear. And lo! the thing was done.

Long, long might the babe wait for his mother, and

weep because she returned not. How was he to know, or his nurse or his grandfather to know, that far in the lonely forest wandered a she-bear, with the frightened heart of a woman in her breast? All his tears could not change that hairy breast back to the white bosom that had pillowed his baby head so tenderly, could not transform rough paws back to the soft hands that had held him so lovingly. And the bear must have suffered, too. For if Juno was unkind enough to wish for revenge at all, she was doubtless unkind enough not to permit the bear to forget that she had been a woman and a mother. I have sometimes wondered if, when, late in the night, the moon shone quietly and sleepily over hillside and town, the bear-mother did not creep up as close to her old home as she dared, and stand looking sadly at house-tops and deserted streets, and long for a sight of her little one; only to steal unsatisfied away in the gray, cold dawn, back to her caves and secret recesses. The story does not say, but I think she must have done so. The pain in her heart, I trow, was very great, like that in the heart of the father in Matthew Arnold's "The Forsaken Merman," a poem I like to read to my children, and one that you will like, too, if you will ask your teacher to find it and read it to you.

Young people forget quickly. Callisto's little Arcas, if he remembered his mother at all, thought of her as dead. He grew through infancy and well into boyhood, active and strong. Like his mother, he became a great hunter.

Then, when he was fifteen years old, came another unlucky day. He was hunting. Suddenly he perceived near him a bear. Neither had heard the other, and both were surprised. At last, he and his mother had

met again. It is possible she saw in him a resemblance to what she had been, or to his father, and recognized him. It is certain that he did not perceive his mother in the shaggy form that stood affrighted before him. For a moment they gazed one upon the other. She had no power to make him understand. And he gave her no time to flee away; but, lifting his bow (bravely, as he would have thought, if he had had time to think about it at all), he was about to send an arrow piercing through her heart.

But the friendship of the gods does not bring only evil. Jupiter had not forgotten the maiden he had once loved so kindly. He could not reunite mother and son by restoring Callisto to human form, for one god may not directly undo what another god has done. He could, nevertheless, do what was still better, since eternal fame is better than a long life, even if life be filled with happiness. What he did do, was, first, to change Arcas into a bear, too, and then to transfer both mother and son as stars to the sky. There you will see them as the constellations of the Greater and the Lesser Bears.

One would have thought that Juno would rest satisfied, now that the woman she had feared as a rival had become a group of stars, and could not possibly again give her cause for jealousy. But the vindictiveness in her heart was even yet unsated. If her hated rival was to be placed among the never-fading stars, her revenge must likewise be eternal. She sought out her brother, Neptune, god of the sea, told him her story, and begged him, as a favor to her, to refuse to permit the mother and son ever to enter his realm. Neptune granted her request; and consequently the Great Bear and the Little

Bear never sink into the ocean, "the baths of all the western stars."

THE TWO BEARS

Change as the stars may from night to night, these two groups, the Great Bear and the Lesser Bear, can be seen from any place in the northern latitudes at any time of the year. We will commence our search by finding them. They are among the easiest to identify, too. Every boy and girl knows the Big Dipper. If you look to the north, you can hardly fail to see it the first thing—seven bright stars set in the shape of a big tin dipper. Four stars make the bowl, and three the handle. Six of these stars are of the second magnitude and one of the third. In the olden times, the Big Dipper was called by some people David's Chariot, the four stars in the bowl representing the wheels, and the three others the horses. Still other people have named them the Seven Oxen, and others again, the Plowshare. In England, Charles's Wain is the popular name. But the name most commonly used is the Great Bear, the stars in the bowl being in the bear's body, and those in the handle being in his tail, as you may see from the chart.

One of the stars in the Great Bear is quite interesting, because it offers an opportunity to see whether you have good, strong eyes or not. The middle star of the three in the tail is named Mizar, and it has a very small companion, called Alcor, "the Test," because it is used as a test of vision, since only a good eye can see it without the help of a telescope.

The two stars that form the outer edge of the bowl

of the Big Dipper are called the "Pointers," because they point to the North Star. When we have found the North Star, we have also found the Lesser Bear, because the North Star is the most important star in this group. The Lesser Bear is like the Great Bear in shape, but is smaller. It is sometimes called the Little Dipper. The North Star is the end star of the Lesser Bear's tail, and the end of the dipper handle; and the four stars of the bowl are in his body. The North Star itself is frequently called Polaris, because a line passed through the earth's poles, and extended into the sky, would come very near it.

Within the last few years it has been discovered that Polaris is whirling very rapidly around a dark companion, and that both together are coming towards us at a tremendous speed. How this is known you can read in "Astronomy Through the Ages," which comes later in this book.

With a knowledge of where the Little and Big Dipper are, and by the aid of the charts, you can easily find all the other constellations in their due times and seasons.

URSA MAJOR

Scholar:

I marvel why (seeing she hath the form of a beare)
her tail should be so long.

Master:

Imagine that Jupiter, fearing to come too nigh unto
her teeth, layde holde on her tayle, and thereby drewe
her up into the heavens; so that she of herself being very
weightie, and the distance from the earth to the heavens

very great, there was great likelihood that her taile must stretch. Other reason have I none.

—THOMAS HOOD.

HYMN TO THE NORTH STAR

THE sad and solemn night
Hath yet her multitude of cheerful fires;
The glorious host of light
Walk the dark hemisphere till she retires;
All through her silent watches, gliding slow,
Her constellations come, and climb the heavens, and go.

Day, too, hath many a star
To grace his gorgeous reign, as bright as they:
Through the blue fields afar,
Unseen, they follow in his flaming way:
Many a bright lingerer, as the eve grows dim,
Tells what a radiant troop arose and set with him.

And thou dost see them rise,
Star of the Pole! and thou dost see them set.
Alone, in thy cold skies,
Thou keep'st thy old unmoving station yet,
Nor join'st the dances of that glittering train,
Nor dipp'st thy virgin orb in the blue western main.

There, at morn's rosy birth,
Thou lookest meekly through the kindling air,
And eve, that round the earth
Chases the day, beholds thee watching there;
There noontide finds thee, and the hour that calls
The shapes of polar flame to scale heaven's azure walls

Alike, beneath thine eye,
The deeds of darkness and of light are done ;
High toward the starlit sky
Towns blaze, the smoke of battle blots the sun,
The night storm on a thousand hills is loud,
And the strong wind of day doth mingle sea and cloud.

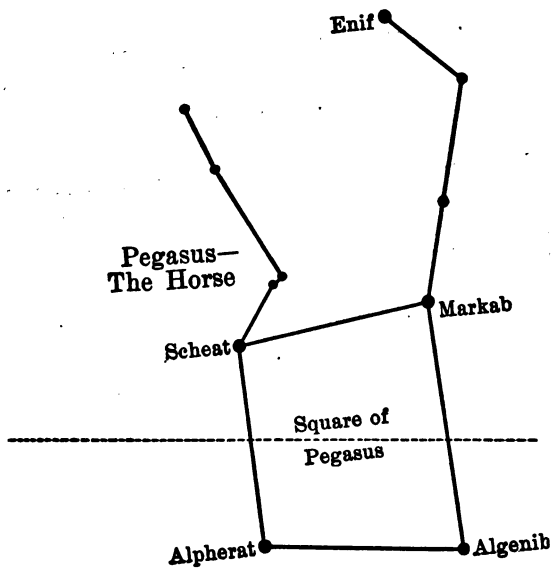
On thy unaltering blaze
The half-wrecked mariner, his compass lost,
Fixes his steady gaze,
And steers, undoubting, to the friendly coast ;
And they who stray in perilous wastes, by night,
Are glad when thou dost shine to guide their footsteps
right.

And, therefore, bards of old,
Sages and hermits of the solemn wood,
Did in thy beams behold
A beauteous type of that unchanging good,
That bright eternal beacon, by whose ray
The voyager of time should shape his heedful way.
—WILLIAM CULLEN BRYANT.

THE WINGED HORSE

PEGASUS

The Bears can be seen every night in the year and all night long. Not so, with most of the constellations. As the earth changes its place in the course of the year, some of them sink out of sight, not to be seen again for months. Each season has its own constellations. All through the autumn, the one called Pegasus, the wonderful Winged Horse, can be seen flying across the sky: He commences these flights early in September, and the last we see of him is in mid-winter, when he flies down in the west after the setting sun.





**He's not four-footed; with no hinder parts,
And shown but half, rises the sacred Horse.**

THE WINGED HORSE

IF you will extend the line that passes from the Pointers to Polaris, you will observe four bright stars (three of them of the second magnitude and one of the third) that form an almost perfect square, known as the Square of Pegasus. One of the stars lies in Andromeda as well as Pegasus. The Square, large as it is, is by no means all of Pegasus. It is in the body of the Horse, and forms only about one-third of the whole constellation. The Horse's head stretches off to the west, where there shines a bright star in its nostril.

The Greeks told a pretty tale of the birth and exploits of Pegasus. When Perseus had slain Medusa—a story which is to be told later on—and was flying back home, carrying her head carefully behind him, some drops of her blood fell into the sea; and Neptune, the god of the sea, because he had been in love with Medusa when she was still beautiful, took these drops and some foam of the sea, and changed them into a beautiful white horse, which rose from the crest of a wave and flew to Olympus for the pleasure of the gods. Very few mortals ever rode this winged steed. There are some who say that Perseus and Andromeda were borne by it up to heaven.

The most famous story, however, is about Bellerophon's ride. When he was a boy, Bellerophon accidentally killed his brother. Home became hateful to him, and so he wandered away. He lived for a time at the court of King Proetus, but he was falsely accused by

Queen Anteia, and Proetus planned his death. He gave him a sealed letter to take to the king of Lycia. When the Lycian king opened it, he found it was a request to put Bellerophon to death. The king of Lycia tried to obey the request, though it was against his will. He told Bellerophon to go and slay the Chimaera, a terrible monster with a lion's head, a goat's body, and a dragon's tail.

Many heroes had attacked the Chimaera, but none had escaped alive. Bellerophon, in great dejection, was comforted by Minerva, who appeared before him and gave him a golden bridle, with directions how and when to use it.

The hero placed himself in hiding beside a spring to which Pegasus sometimes came to drink. When the winged steed came and stooped to the water, Bellerophon leaped upon its back. He got the golden bit between the horse's teeth, and immediately it became perfectly gentle, though it had never been ridden by a mortal before. Pegasus bore Bellerophon to where the Chimaera was, and together they bore down upon the monster, and, of course, Bellerophon slew it.

After other adventures, the hero returned to Lycia, and married the king's lovely daughter. But his heart became full of pride; he thought himself equal to the gods, and determined to mount Pegasus and ride up to Olympus. He might have succeeded, but Jupiter, angered by his presumption, sent a gadfly, which stung the horse so painfully that it reared and plunged until Bellerophon was dismounted and thrown to the earth far below. After that adventure Pegasus was never lent to a mortal again.

The story of the destruction of the Chimaera has

been told at length by our great American writer, Nathaniel Hawthorne, in his beautiful manner, a part of whose story I must quote for you, changing just three or four words.

THE CHIMAERA

BELLEROPHON'S heart began to throb! He gazed keenly upward, but could not see the winged creature, whether bird or horse; because just then it had plunged into the fleecy depths of a summer cloud. It was but a moment, however, before the object reappeared, sinking lightly down out of the cloud, although still at a vast distance from the earth. Bellerophon shrank back, so that he was hidden among the thick shrubbery which grew all around the fountain. Not that he was afraid of any harm, but he dreaded lest, if Pegasus caught a glimpse of him, he would fly far away, and alight in some inaccessible mountain-top. For it was really the winged horse. After he had expected him so long, he was coming to quench his thirst with the water of Pirene.

Nearer and nearer came the aerial wonder, flying in great circles, as you may have seen a dove when about to alight. Downward came Pegasus, in those wide, sweeping circles, which grew narrower, and narrower still, as he gradually approached the earth. The nigher the view of him, the more beautiful he was, and the more marvelous the sweep of his silvery wings. At last, with so light a pressure as hardly to bend the grass about the fountain, or imprint a hoof-tramp in the sand of its margin, he alighted, and, stooping his wild head, began to drink. He drew in the water, with long and pleasant sighs, and tranquil pauses of enjoyment;

and then another draught, and another, and another. For, nowhere in the world, or up among the clouds, did Pegasus love any water as he loved this of Pirene. And when his thirst was slaked, he cropped a few of the honey-blossoms of the clover, delicately tasting them, but not caring to make a hearty meal, because the herbage, just beneath the clouds, on the lofty sides of Mount Helicon, suited his palate better than this ordinary grass.

After thus drinking to his heart's content, and, in his dainty fashion, condescending to take a little food, the winged horse began to caper to and fro, and dance, as it were, out of mere idleness and sport. There never was a more playful creature made than this very Pegasus. So there he frisked, in a way that it delights me to think about, fluttering his great wings as lightly as ever did a linnet, and running little races, half on earth and half in air, and which I know not whether to call a flight or a gallop. When a creature is perfectly able to fly, he sometimes chooses to run, just for the pastime of the thing; and so did Pegasus, although it cost him some little trouble to keep his hoofs so near the ground. Bellerophon, meanwhile, peeped forth from the shrubbery, and thought that never was any sight so beautiful as this, nor ever a horse's eyes so wild and spirited as those of Pegasus. It seemed a sin to think of bridling him and riding on his back.

Once or twice Pegasus stopped, and snuffed the air, pricking up his ears, tossing his head, and turning it on all sides, as if he partly suspected some mischief or other. Seeing nothing, however, and hearing no sound, he soon began his antics again.

At length,—not that he was weary, but only idle and

luxurious,—Pegasus folded his wings, and lay down on the soft green turf. But, being too full of aerial life to remain quiet for many moments together, he soon rolled over on his back, with his four slender legs in the air. It was beautiful to see him, this one solitary creature, whose mate had never been created, but who needed no companion, and, living a great many hundred years, was as happy as the centuries were long. The more he did such things as mortal horses are accustomed to do, the less earthly and the more wonderful he seemed. Bellerophon almost held his breath, partly from a delightful awe, but still more because he dreaded lest the slightest stir or murmur should send him up, with the speed of an arrow-flight, into the farthest blue of the sky.

Finally, when he had had enough of rolling over and over, Pegasus turned himself about, and, indolently, like any other horse, put out his legs, in order to rise from the ground; and Bellerophon, who had guessed that he would do so, darted suddenly from the thicket and leaped astride of his back.

Yes, there he sat, on the back of the winged horse!

But what a bound did Pegasus make, when, for the first time, he felt the weight of a mortal man upon his loins! A bound, indeed! Before he had time to draw a breath, Bellerophon found himself five hundred feet aloft, and still shooting upward, while the winged horse snorted and trembled with terror and anger. Upward he went, up, up, up, until he plunged into the cold misty bosom of a cloud, at which, only a little while before, Bellerophon had been gazing, and fancying it a very pleasant spot. Then, again, out of the heart of the cloud, Pegasus shot down like a thunderbolt, as if he

meant to dash both himself and his rider headlong against a rock. Then he went through about a thousand of the wildest caprioles that had ever been performed either by a bird or a horse.

I cannot tell you half that he did. He skimmed straight forward, and sideways, and backward. He reared himself erect, with his forelegs on a wreath of mist, and his hindlegs on nothing at all. He flung out his heels behind, and put down his head between his legs, with his wings pointing right upward. At about two miles' height above the earth, he turned a somerset, so that Bellerophon's heels were where his head should have been, and he seemed to look down into the sky, instead of up. He twisted his head about, and, looking Bellerophon in the face, with fire flashing from his eyes, made a terrible attempt to bite him. He fluttered his pinions so wildly that one of the silver feathers was shaken out, and, floating earthward, was picked up by a child, who kept it as long as he lived, in memory of Pegasus and Bellerophon.

But the latter (who, as you may judge, was as good a horseman as ever galloped) had been watching his opportunity, and at last clapped the golden bit of the enchanted bridle between the winged steed's jaws. No sooner was this done than Pegasus became as manageable as if he had taken food, all his life, out of Bellerophon's hand. To speak what I really feel, it was almost a sadness to see so wild a creature grow suddenly so tame. And Pegasus seemed to feel it so, likewise. He looked round to Bellerophon, with the tears in his beautiful eyes, instead of the fire that so recently flashed from them. But when Bellerophon patted his head, and spoke a few authoritative, yet kind and soothing, words,

another look came into the eyes of Pegasus; for he was glad at heart, after so many lonely centuries, to have found a companion and a master.

Thus it always is with winged horses, and with all such wild and solitary creatures. If you can catch and overcome them, it is the surest way to win their love.

While Pegasus had been doing his utmost to shake Bellerophon off his back, he had flown a very long distance; and they had come within sight of a lofty mountain by the time the bit was in his mouth. Bellerophon had seen this mountain before, and knew it to be Helicon, on the summit of which was the winged horse's abode. Thither (after looking gently into his rider's face, as if to ask leave) Pegasus now flew, and, alighting, waited patiently until Bellerophon should please to dismount. The young man, accordingly, leaped from his steed's back, but still held him fast by the bridle. Meeting his eyes, however, he was so affected by the gentleness of his aspect and by the thought of the free life which Pegasus had heretofore lived, that he could not bear to keep him a prisoner, if he really desired his liberty.

Obeying this generous impulse he slipped the enchanted bridle off the head of Pegasus, and took the bit from his mouth.

"Leave me, Pegasus!" said he. "Either leave me, or love me."

In an instant the winged horse shot almost out of sight, soaring straight upward from the summit of Mount Helicon. Being long after sunset, it was now twilight on the mountain-top, and dusky evening over all the country round about. But Pegasus flew so high that he overtook the departed day, and was bathed in

the upper radiance of the sun. Ascending higher and higher, he looked like a bright speck, and, at last, could no longer be seen in the hollow waste of the sky. And Bellerophon was afraid that he should never behold him more. But, while he was lamenting his own folly, the bright speck reappeared, and drew nearer and nearer, until it descended lower than the sunshine; and, behold, Pegasus had come back! After this trial there was no more fear of the winged horse's making his escape. He and Bellerophon were friends, and put loving faith in one another.

That night they lay down and slept together, with Bellerophon's arm about the neck of Pegasus, not as a caution, but for kindness. And they awoke at peep of day, and bade one another good-morning, each in his own language.

In this manner, Bellerophon and the wondrous steed spent several days, and grew better acquainted and fonder of each other all the time. They went on long aerial journeys, and sometimes ascended so high that the earth looked hardly bigger than—the moon. They visited distant countries, and amazed the inhabitants, who thought that the beautiful young man, on the back of the winged horse, must have come down out of the sky. A thousand miles a day was no more than an easy space for the fleet Pegasus to pass over. Bellerophon was delighted with this kind of life, and would have liked nothing better than to live always in the same way, aloft in the clear atmosphere; for it was always sunny weather up there, however cheerless and rainy it might be in the lower region. But he could not forget the horrible Chimaera, which he had promised King Iobates to slay. So, at last, when he had become well accus-

tomed to feats of horsemanship in the air, and could manage Pegasus with the least motion of his hand, and had taught him to obey his voice, he determined to attempt the performance of this perilous adventure.

At daybreak, therefore, as soon as he unclosed his eyes, he gently pinched the winged horse's ear, in order to arouse him. Pegasus immediately started from the ground, and pranced about a quarter of a mile aloft, and made a grand sweep around the mountain top, by way of showing that he was wide awake, and ready for any kind of an excursion. During the whole of this little flight, he uttered a loud, brisk, and melodious neigh, and finally came down at Bellerophon's side, as lightly as ever you saw a sparrow hop upon a twig.

"Well done, dear Pegasus! well done, my sky-skimmer!" cried Bellerophon, fondly stroking the horse's neck. "And now, my fleet and beautiful friend, we must break our fast. To-day we are to fight the terrible Chimaera."

As soon as they had eaten their morning meal, and drank some sparkling water from a spring called Hippocrene, Pegasus held out his head, of his own accord, so that his master might put on the bridle. Then, with a great many playful leaps and airy caperings, he showed his impatience to be gone; while Bellerophon was girding on his sword, and hanging his shield about his neck, and preparing himself for battle. When everything was ready, the rider mounted, and (as was his custom, when going a long distance) ascended five miles perpendicularly, so as the better to see whither he was directing his course. He then turned the head of Pegasus towards the east, and set out for Lycia. In their flight they overtook an eagle, and came so nigh

him, before he could get out of their way, that Bellerophon might easily have caught him by the leg. Hastening onward at this rate, it was still early in the forenoon when they beheld the lofty mountains of Lycia, with their deep and shaggy valleys. If Bellerophon had been told truly, it was in one of those dismal valleys that the hideous Chimaera had taken up its abode.

Being now so near their journey's end, the winged horse gradually descended with his rider; and they took advantage of some clouds that were floating over the mountain-tops, in order to conceal themselves.

Hovering on the upper surface of a cloud, and peeping over its edge, Bellerophon had a pretty distinct view of the mountainous part of Lycia, and could look into all its shadowy vales at once. At first there appeared to be nothing remarkable. It was a wild, savage, and rocky tract of high and precipitous hills. In the more level part of the country, there were the ruins of houses that had been burnt, and, here and there, the carcasses of dead cattle, strewn about the pastures where they had been feeding.

"The Chimaera must have done this mischief," thought Bellerophon. "But where can the monster be?"

As I have already said, there was nothing remarkable to be detected, at first sight, in any of the valleys and dells that lay among the precipitous heights of the mountain. Nothing at all; unless, indeed, it were three spires of black smoke, which issued from what seemed to be the mouth of a cavern, and clambered sullenly into the atmosphere. Before reaching the mountain-top, these three black smoke-wreaths mingled themselves

into one. The cavern was almost directly beneath the winged horse and his rider, at the distance of about a thousand feet. The smoke, as it crept heavily upward, had an ugly, sulphurous, stifling scent, which caused Pegasus to snort and Bellerophon to sneeze. So disagreeable was it to the marvelous steed (who was accustomed to breathe only the purest air), that he waved his wings, and shot half a mile out of the range of this offensive vapor.

But, on looking behind him, Bellerophon saw something that induced him first to draw the bridle, and then to turn Pegasus about. He made a sign, which the winged horse understood, and sunk slowly through the air, until his hoofs were scarcely more than a man's height above the rocky bottom of the valley. In front, as far off as you could throw a stone, was the cavern's mouth, with the three smoke-wreaths oozing out of it. And what else did Bellerophon behold there?

There seemed to be a heap of strange and terrible creatures curled up within the cavern. Their bodies lay so close together that Bellerophon could not distinguish them apart; but, judging by their heads, one of these creatures was a huge snake, the second a fierce lion, and the third an ugly goat. The lion and the goat were asleep; the snake was broad awake, and kept staring around him with a great pair of fiery eyes. But—and this was the most wonderful part of the matter—the three spires of smoke evidently issued from the nostrils of these three heads! So strange was the spectacle that, though Bellerophon had been all along expecting it, the truth did not immediately occur to him, that here was the terrible three-headed Chimaera. He had

found out the Chimaera's cavern. The snake, the lion, and the goat, as he supposed them to be, were not three separate creatures, but one monster!

The wicked, hateful thing! Slumbering, as two-thirds of it were, it still held, in its abominable claws, the remnant of an unfortunate lamb,—or possibly (but I hate to think so) it was a dear little boy,—which its three mouths had been gnawing, before two of them fell asleep!

All at once, Bellerophon started as from a dream, and knew it to be the Chimaera. Pegasus seemed to know it, at the same instant, and sent forth a neigh, that sounded like the call of a trumpet to battle. At this sound the three heads reared themselves erect, and belched out great flashes of flame. Before Bellerophon had time to consider what to do next, the monster flung itself out of the cavern and sprung straight towards him, with its immense claws extended, and its snaky tail twisting itself venomously behind. If Pegasus had not been as nimble as a bird, both he and his rider would have been overthrown by the Chimaera's headlong rush, and thus the battle have been ended before it was well begun. But the winged horse was not to be caught so. In the twinkling of an eye he was up aloft, half-way to the clouds, snorting with anger. He shuddered, too, not with affright, but with utter disgust at the loathsomeness of this poisonous thing with three heads.

The Chimaera, on the other hand, raised itself up so as to stand absolutely on the tip-end of its tail, with its talons pawing fiercely in the air, and its three heads spluttering fire at Pegasus and his rider. My stars, how it roared, and hissed, and bellowed! Bellerophon,

meanwhile, was fitting his shield on his arm, and drawing his sword.

"Now, my beloved Pegasus," he whispered in the winged horse's ear, "thou must help me to slay this insufferable monster; or else thou shalt fly back to thy solitary mountain-peak without thy friend Bellerophon. For either the Chimaera dies, or its three mouths shall gnaw this head of mine, which has slumbered upon thy neck!"

Pegasus whinnied, and, turning back his head, rubbed his nose tenderly against his rider's cheek. It was his way of telling him that, though he had wings and was an immortal horse, yet he would perish, rather than leave Bellerophon behind.

"I thank you, Pegasus," answered Bellerophon. "Now, then, let us make a dash at the monster!"

Uttering these words, he shook the bridle; and Pegasus darted down aslant, as swift as the flight of an arrow, right towards the Chimaera's threefold head, which, all this time, was poking itself as high as it could into the air. As he came within arm's-length, Bellerophon made a cut at the monster, but was carried onward by his steed before he could see whether the blow had been successful. Pegasus continued his course, but soon wheeled round, at about the same distance from the Chimaera as before. Bellerophon then perceived that he had cut the goat's head of the monster almost off, so that it dangled downward by the skin, and seemed quite dead.

But, to make amends, the snake's head and the lion's head had taken all the fierceness of the dead one into themselves, and spit flame, and hissed, and roared, with a vast deal more fury than before.

"Never mind, my brave Pegasus!" cried Bellerophon. "With another stroke like that, we will stop either its hissing or its roaring."

And again he shook the bridle. Dashing aslantwise, as before, the winged horse made another arrow-flight towards the Chimaera, and Bellerophon aimed another downright stroke at one of the two remaining heads, as he shot by. But this time, neither he nor Pegasus escaped so well as at first. With one of its claws, the Chimaera had given the young man a deep scratch in his shoulder, and had slightly damaged the left wing of the flying steed with the other. On his part Bellerophon had mortally wounded the lion's head of the monster, insomuch that it now hung downward, with its fire almost extinguished, and sending out gasps of thick black smoke. The snake's head, however (which was the only one left now) was twice as fierce and venomous as ever before. It belched forth shoots of fire five hundred yards long, and emitted hisses so loud, so harsh, and so ear-piercing, that King Iobates heard them, fifty miles off, and trembled till the throne shook under him.

"Well-a-day!" thought the poor king; "the Chimaera is certainly coming to devour me!"

Meanwhile Pegasus had again paused in the air, and neighed angrily, while sparkles of a pure crystal flame darted out of his eyes. How unlike the lurid fire of the Chimaera! The aerial steed's spirit was all aroused, and so was that of Bellerophon.

"Dost thou bleed, my immortal horse?" cried the young man, caring less for his own hurt than for the anguish of this glorious creature, that ought never to have tasted pain. "The execrable Chimaera shall pay for this mischief with his last head!"

Then he shook the bridle, shouted loudly, and guided Pegasus not aslantwise as before, but straight at the monster's hideous front. So rapid was the onset, that it seemed but a dazzle and a flash before Bellerophon was at close grips with his enemy.

The Chimaera, by this time, after losing its second head, had got into a red-hot passion of pain and rampant rage. It so flounced about, half on earth and partly in the air, that it was impossible to say which element it rested upon. It opened its snake-jaws to such an abominable width that Pegasus might almost, I was going to say, have flown right down its throat, wings outspread, rider and all. At their approach it shot out a tremendous blast of its fiery breath and enveloped Bellerophon and his steed in a perfect atmosphere of flame, singeing the wings of Pegasus, scorching off one whole side of the young man's golden ringlets, and making them both far hotter than was comfortable, from head to foot.

But this was nothing to what followed.

When the airy rush of the winged horse had brought him within the distance of a hundred yards, the Chimaera gave a spring, and flung its awkward, huge, venomous, and utterly detestable carcass right upon poor Pegasus, clung round him with might and main, and tied up its snaky tail into a knot! Up flew the aerial steed, higher, higher, higher, above the mountain-peaks, above the clouds, and almost out of sight of the solid earth. But still the earth-born monster kept its hold, and was borne upward along with the creature of light and air. Bellerophon, meanwhile turning about, found himself face to face with the ugly grimness of the Chimaera's visage, and could only avoid being scorched

to death, or bitten right in twain by holding up his shield. Over the upper edge of the shield, he looked sternly into the savage eyes of the monster.

But the Chimaera was so mad and wild with pain, that it did not guard itself so well as might else have been the case. Perhaps, after all, the best way to fight a Chimaera is by getting as close to it as you can. In its efforts to stick its horrible iron claws into its enemy, the creature left its own breast quite exposed; and perceiving this, Bellerophon thrust his sword up to the hilt into its cruel heart. Immediately the snaky tail untied its knot. The monster let go its hold of Pegasus, and fell from that vast height downward; while the fire within its bosom, instead of being put out, burned fiercer than ever, and quickly began to consume the dead carcass. Thus it fell out of the sky, all aflame, and (it being nightfall before it reached the earth) was mistaken for a shooting-star or a comet. But, at early sunrise, some cottagers were going to their day's labor, and saw, to their astonishment, that several acres of ground were strewn with black ashes. In the middle of a field, there was a heap of whitened bones a great deal higher than a haystack. Nothing else was ever seen of the dreadful Chimaera!

—NATHANIEL HAWTHORNE.

PEGASUS IN POUND

ONCE into a quiet village,
Without haste and without heed,
In the golden prime of morning,
Strayed the poet's wingèd steed.

It was Autumn, and incessant
Piped the quails from shocks and sheaves,
And, like living coals, the apples
Burned among the withering leaves.

Loud the clamorous bell was ringing
From its belfry gaunt and grim;
'Twas the daily call to labor,
Not a triumph meant for him.

Not the less he saw the landscape,
In its gleaming vapor veiled;
Not the less he breathed the odors
That the dying leaves exhaled.

Thus, upon the village common,
By the school-boys he was found;
And the wise men, in their wisdom,
Put him straightway into pound.

Then the somber village crier,
Ringing loud his brazen bell,
Wandered down the street proclaiming
There was an estray to sell.

And the curious country people,
Rich and poor, and young and old,
Came in haste to see this wondrous
Wingèd steed, with mane of gold.

Thus the day passed, and the evening
Fell, with vapors cold and dim;
But it brought no food nor shelter,
Brought no straw nor stall for him.

Patiently, and still expectant,
Looked he through the wooden bars,
Saw the moon rise o'er the landscape,
Saw the tranquil, patient stars;

Till at length the bell at midnight
Sounded from its dark abode,
And, from out a neighboring farm-yard,
Loud the cock Alectryon crowed.

Then, with nostrils wide distended,
Breaking from his iron chain,
And unfolding far his pinions,
To those stars he soared again.

On the morrow, when the village
Woke to all its toil and care,
Lo! the strange steed had departed,
And they knew not when nor where.

But they found, upon the greensward
Where his struggling hoofs had trod,
Pure and bright, a fountain flowing
From the hoof-marks in the sod.

From that hour, the fount unfailing
Gladdens the whole region round,
Strengthening all who drink its waters,
While it soothes them with its sound.

—HENRY WADSWORTH LONGFELLOW.

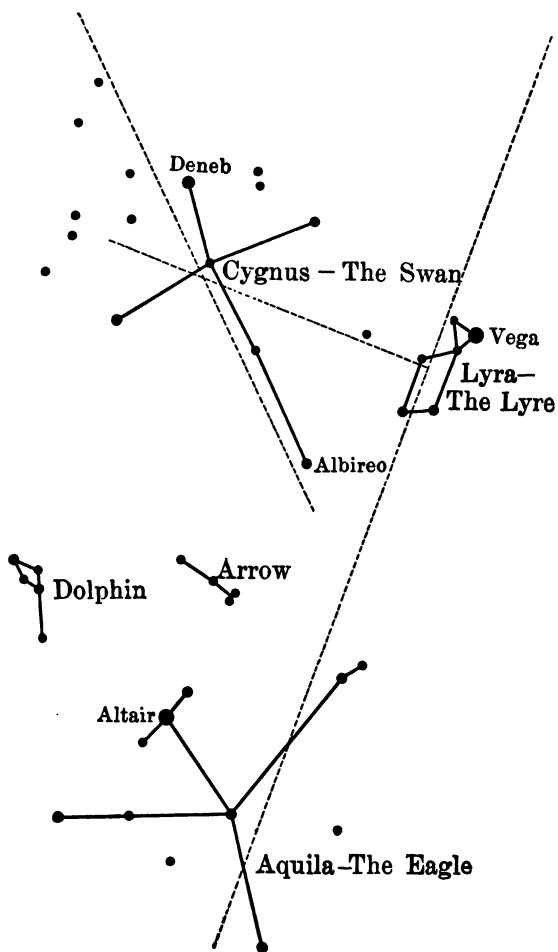
THE SUMMER TRIANGLE GROUP

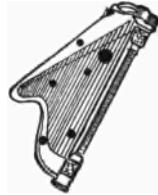
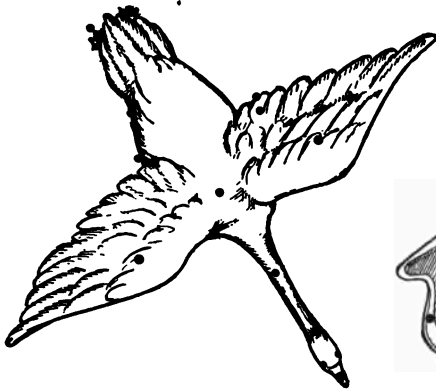
LYRA—AQUILA—CYGNUS—SAGITTA—DELPHINUS

These constellations belong to the summer and early fall, but if we have not spent too much time with Pegasus we can find them high in the west in October. Some of them can still be seen early in the evening, hanging low down in the west, as late as December. If you have missed them in the fall, you can look forward to finding them next summer.

Vega is the brightest star in Lyra, Altair in Aquila, and Deneb in Cygnus. The triangle made by the three stars, with Altair as the apex, is an almost perfect isosceles triangle.

The Eagle, in the old charts, is represented as if seen from below, and is clasping the boy with his sharp claws. The design of the present drawing was suggested by a modern mural painting in the Library of Congress.





Everything that heard him play,
Even the billows of the sea,
Hung their heads, and then lay by.

—SHAKESPEARE.

THE SUMMER TRIANGLE GROUP

THE LYRE—THE EAGLE—THE SWAN—THE ARROW—THE
DOLPHIN

MERCURY (or Hermes), son of Jupiter, and one of the twelve gods of Olympus, was god of merchants and of thieves; and he was wondrously fond of teasing. On the very day he was born, he escaped from his mother, stole the Cows of the Sun, and drove them off to a cave, where he ate two of them and hid the rest. The next day, while he was playing on the sea-shore, he found the shell of a tortoise. He seized upon it for a plaything, bored holes along the edges, stretched strings across it, and found he could make music with it. But the lyre, which he had invented in this way, was not to be his for long. The cattle he had stolen were sacred to Apollo, the god of the sun, who soon discovered the thief, and was not to be appeased until Mercury gave him the lyre as a peace-offering. Apollo was god of music, as well as of the sun, and was delighted with the new instrument.

Down on the earth lived Orpheus, a beautiful musician whom Apollo loved. As a mark of his special favor, Apollo lent the lyre to Orpheus, who then was able to make music so exquisite that not only men and birds, but even the trees and the very rocks, were charmed. But Orpheus fell in love with Eurydice, and became so absorbed in his passion he forgot his music. Then Apollo was vexed, and bade a serpent go and sting

Eurydice to death. Orpheus knew that the dead departed to dwell among the shades in Hades. He took the lyre, and went in search of Eurydice. When he came before the ruler of the lower regions, then did

Orpheus sing
Such notes as, warbled to the string,
Drew iron tears down Pluto's cheek,
And made Hell grant what love did seek.

—MILTON: *Il Penseroso*.

He played such sweet music that Pluto consented to allow Eurydice to follow her lover back to the upper world if Orpheus would not turn to look upon her before they emerged from Hades. Alas! love was too strong. Orpheus did look back, and his half-regained Eurydice was lost to him. After the death of the disconsolate Orpheus, Apollo took back the lyre, and placed it among the stars.

I saw, with its celestial keys,
Its chords of air, its frets of fire,
The Samian's great Æolian lyre,
Rising thro' all its sevenfold bars
From earth unto the fixèd stars.

—LONGFELLOW: *The Occultation of Orion*.

Lyra is a small constellation, but it is easily found. You have only to look back of the bowl of the Little Dipper, and there you will see it shining conspicuously. Its brightest star is Vega, a star of the first magnitude, one of the three brightest in the Northern Hemisphere. Its blue-white rays are wonderfully brilliant. The actual size of Vega must be very great, probably a hun-

dred times that of our sun. Two small stars (between the fourth and the fifth magnitude) form a tiny triangle with Vega. And one of these stars and three other little ones make up a quadrangle.

Not far from Lyra is Aquila, the Eagle, concerning which the following story is told. Hebe was long the cup-bearer for the gods, but once she tripped and fell. After this unlucky accident she was no longer considered fitted for her office, and had to resign it. Jupiter, having surveyed mankind and chosen the son of a king of Troy as the most beautiful, despatched his sacred bird, the eagle, to fetch the youth to heaven.

And godlike Ganymede, most beautiful
Of men, the gods beheld, and caught him up
To heaven, so beautiful was he, to pour
The wine of Jove, and ever dwell with them.
—HOMER (Bryant's translation).

For his services the eagle was placed among the constellations.

To find Aquila, you follow a line from the Little Dipper to Lyra, and then on about as far the other side of Lyra. Its brightest star (first magnitude) is Altair, in the neck or body of the Eagle. Altair has two attendants, one on each side, and both quite close. One is of the third magnitude, the other of the fourth.

Another neighbor of Lyra is Cygnus, which is also associated with Apollo, though more remotely than Lyra. Apollo had a son, Phaethon, who persuaded his father to allow him to drive the chariot of the sun around the world for one day. But the horses were too strong for Phaethon to manage; they ran away, and approached so close to earth that everything was about to burn up.

Jupiter saw what was happening, and hurled one of his bolts of thunder at the young charioteer, who fell headlong into the river Eridanus. Cygnus, the intimate friend of Phaethon, gathered all the charred remains of the body he could find, and gave them burial. In his grief he kept diving into the river, to find still other fragments. In this dismal task he looked so like a swan, which is always diving mournfully, that the gods out of pity turned him into a swan, and transferred him to the sky.

Cygnus is between Lyra and Pegasus, and is more commonly called the Northern Cross. Deneb, the brightest star of the group, is not quite of the first magnitude, but is classed with the first magnitude stars. In the beak of the Swan—or the foot of the Cross—is Albireo, which a good pair of field glasses reveals as a double star. The smallest telescope shows immediately that one of the doublets is of the third magnitude, and the other of the seventh. The larger is a light yellow in color, and the smaller a deep blue. The blue of the smaller star is so pronounced, and the contrast between the two is so remarkable, that Albireo is one of the favorite show objects to the possessor of a small telescope.

About half-way between Altair and Albireo is a tiny constellation of the fourth and fifth magnitude stars named the Arrow, or Sagitta.

There lies an Arrow—from what bow it fell
Near to the flying Swan, no Poets tell.

Between Altair and Pegasus lies the remarkably beautiful and tiny constellation of the Dolphin—more often called Job's Coffin.



GANYMEDE
(From the painting by George Frederick Watts)

With four fair stars he decks the summer skies,
Sparkling and soft as maiden's beauteous eyes.

The Dolphin owes its place among the stars to its kindness of heart and its love of music. Arion, the famous lyric poet and musician, had gone to Italy and gained great wealth by his profession. When he was returning to Lesbos, his native island, the seamen resolved to murder him that they might have his riches. He persuaded them to allow him to play his lute once more. He sang so sweetly that all the fish were enraptured and gathered around the boat. Then Arion cast himself overboard to escape the seamen, and a dolphin took him on his back and brought him safely to land. Arion went to the king, and told him of his escape. The first time the sailors came to land, they were crucified. None of the Dolphin's stars are very bright ones; two are of the third magnitude, and three of the fourth; the rest are all smaller.

THE FINDING OF THE LYRE

THERE lay upon the ocean's shore
What once a tortoise served to cover;
A year or more, with rush and roar,
The surf had rolled it over,
Had played with it, and flung it by,
As wind and weather might decide it,
Then tossed it high where sand-drifts dry
Cheap burial might provide it.

It rested there to bleach or tan,
The rains had soaked, the suns had burned it;
With many a ban the fisherman

Had stumbled o'er and spurned it;
And there the fisher-girl would stay,
Conjecturing with her brother
How in their play the poor estray
Might serve some use or other.

So there it lay, through wet and dry
As empty as the last new sonnet,
Till by and by came Mercury,
And, having mused upon it,
“ Why, here,” cried he, “ the thing of things
In shape, material, and dimension!
Give it but strings, and, lo, it sings,
A wonderful invention! ”

So said, so done; the chords he strained,
And, as his fingers o'er them hovered,
The shell disdained a soul had gained,
The lyre had been discovered.
O empty world! that round us lies,
Dead shell, of soul and thought forsaken,
Brought we but eyes like Mercury's
In thee what songs should waken!

—JAMES RUSSELL LOWELL.

ORPHEUS AND EURYDICE *

CLOUD upon cloud, the purple pinewoods clung to the
rich Arcadian mountains,
Holy-sweet as a column of incense, where Eurydice
roamed and sung:

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All the hues of the gates of heaven flashed from the
white enchanted fountains

Where in the flowery glades of the forests the rivers
that sing to Arcadia sprung.

Down to the valley she came, for far and far below in
the dreaming meadows

Pleaded ever the Voice of voices, calling his love by
her golden name;

So she arose from her home in the hills, and down
through the blossoms that danced with their
shadows,

Out of the blue of the dreaming distance, down to the
heart of her lover she came.

Lost in his new desire
He dreamed away the hours;
His lyre
Lay buried in the flowers:

To whom the King of Heaven,
Apollo, lord of light,
Had given
Beauty and love and might:

*Yet in his dream's desire
He drowsed away the hours:
His lyre
Lay buried in the flowers.*

Then in his wrath arose
Apollo, lord of light,
That shows
The wrong deed from the right;

How all good things await
The soul that pays the price
To Fate
By equal sacrifice;

And how on him that sleeps
For less than labor's sake,
There creeps,
Uncharmed, the Pythian snake.

Was not the menace indeed more silent? Ah, what care
for labor and sorrow?
Gods in the meadows of moly and amaranth surely
might envy their deep sweet bed
Here where the butterflies troubled the lilies of peace,
and took no thought for the morrow,
And golden-girdled bees made feast as over the lotus
the soft sun spread.

Nearer, nearer the menace glided, out of the gorgeous
gloom around them,
Out of the poppy-haunted shadows deep in the heart
of the purple brake;
Till through the hush and the heat as they lay, and their
own sweet listless dreams enwound them,—
Mailed and mottled with hues of the grape-bloom, sud-
denly, quietly, glided the snake.

Subtle as jealousy, supple as falsehood, diamond-headed
and cruel as pleasure,
Coil by coil he lengthened and glided, straight to the
fragrant curve of her throat:

There in the print of the last of the kisses that still
glowed red from the sweet long pressure,
Fierce as famine and swift as lightning over the glittering lyre he smote.

And over the cold white body of love and delight
Orpheus arose in the terrible storm of his grief,
With quivering up-clutched hands, deadlly and white,
And his whole soul wavered and shook like a wind-swept leaf:

As a leaf that beats on a mountain, his spirit in vain
Assaulted his doom and beat on the Gates of Death:
Then prone with his arms o'er the lyre he sobbed out
his pain,
And the tense chords faintly gave voice to the pulse
of his breath.

And he heard it and rose, once again, with the lyre in
his hand,
And smote out the cry that his white-lipped sorrow
denied:
And the grief's mad ecstasy swept o'er the summer-sweet
land,
And gathered the tears of all Time in the rush of its
tide.

There was never a love forsaken or faith forsworn,
There was never a cry for the living or moan for the
slain,
But was voiced in that great consummation of song; ay,
and borne
To storm on the Gates of the land whence none
cometh again.

Transcending the barriers of earth, comprehending them
all,

He followed the soul of his loss with the night in his
eyes;

And the portals lay bare to him there; and he heard the
faint call

Of his love o'er the rabble that wails by the river of
sighs.

Oh then, through the soul of the Singer, a pity so vast
Mixed with his anguish that, smiting anew on his lyre,
He caught up the sorrows of hell in his utterance at last,
Comprehending the need of them all in his own great
desire.

On through the deserts of hell she came; for over the
fierce and frozen meadows

Pleaded ever the Voice of voices, calling his love by
her golden name;

So she arose from her grave in the darkness, and up
through the wailing fires and shadows,

On by chasm and cliff and cavern, out of the horrors
of death she came.

Then had she followed him, then had he won her, striking
a chord that should echo for ever,

Had he been steadfast only a little, nor paused in the
great transcendent song;

But ere they had won to the glory of day, he came to
the brink of the flaming river

And ceased, to look on his love a moment, a little mo-
ment, and overlong.



ORPHEUS AND EURYDICE
(From the painting by George Frederick Watts)

He gazed: he ceased to smite
The golden-chorded lyre:
 Delight
Consumed his heart with fire.

Though in that deadly land
His task was but half-done,
 His hand
Drooped, and the fight half-won.

Out of his hand the lyre
Suddenly slipped and fell,
 The fire
Acclaimed it into hell.

The night grew dark again:
There came a bitter cry
 Of pain,
Oh Love, once more I die!

And lo, the earth-dawn broke,
And like a wraith she fled:
 He woke
Alone: his love was dead.

Though the golden lute of Orpheus gathered the splen-
dors of earth and heaven,
All the golden greenwood notes and all the chimes of
the changing sea,
Old men over the fires of winter murmur again that he
was not given
The steadfast heart divine to rule that infinite freedom
of harmony.

Therefore he failed, say they; but we, that have no wisdom, can only remember

How through the purple perfumed pinewoods white
Eurydice roamed and sung:

How through the whispering gold of the wheat, where
the poppy burned like a crimson ember,

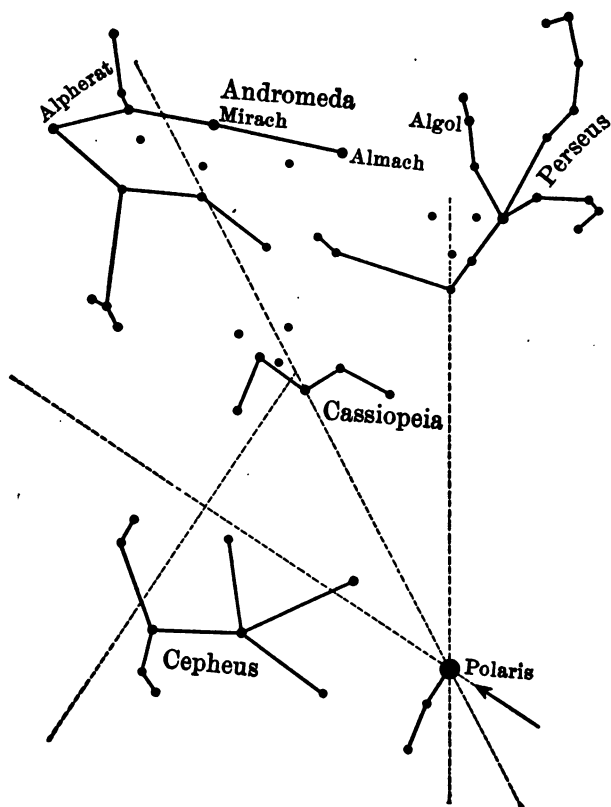
Down to the valley in beauty she came, and under her
feet the flowers upsprung.

—ALFRED NOYES.

THE ROYAL FAMILY

CEPHEUS—CASSIOPEIA
PERSEUS—ANDROMEDA

The four constellations of the Royal Family rise with Pegasus or directly after him. They can be found in the east in October, and the most important ones are overhead in December. In northern latitudes Cepheus and Cassiopeia never set. Andromeda is low down in the west in February, with Perseus following close behind.





Long, I trow,
Thou wilt not seek her in the nightly sky,
So bright her head, so bright
Her shoulders, feet, and girdle.
Yet even there she has her arms extended,
And shackled, even in heaven; uplifted,
Outspread eternally, are those fair hands.

—ARATUS.

THE ROYAL FAMILY

ON the opposite side of Polaris from the Great Dipper are the four constellations of the Royal Family: King Cepheus, with his wife, Queen Cassiopeia; their daughter, the Princess Andromeda, the heroine of the legend; and the Princess's lover, Perseus, the golden-haired hero. None of the four is especially bright, and all except Cassiopeia are hard to find; but with the aid of the chart you can soon locate them.

Cepheus, the dimmest, with no star much brighter than the third magnitude, is just back of the Lesser Bear.

Next is Cassiopeia, five of whose stars form a W that lies open to the Pole Star, and is about as far from Polaris on one side as the Pointers are on the other. This W is also called Cassiopeia's Chair, and there the Queen sits throned in heaven. A line commencing at the star that joins the handle and the bowl of the Big Dipper and drawn through Polaris, passes through Cassiopeia, and, when extended on, through Andromeda.

The constellation of Andromeda shares one of its brightest stars, named Alpherat, with the constellation of Pegasus, the Winged Horse. It is in Andromeda's head and the Horse's body. The other bright stars, two of the second magnitude and one of the third, stretch along back of the W. By using your chart, and starting with Alpherat, you can soon find the Princess, with her hands chained high in the heavens, as Perseus found

her with her hands chained high to the rock by the seashore.

Below Andromeda is her lover Perseus, watching eternally, and ever ready to protect her against any harm that may threaten, his uplifted sword in one hand and the dread Medusa's head in the other.

The most interesting of all the stars of the Royal Family is in Perseus. A line from the end star of the Lesser Bear through Polaris passes near it. Its name is Algol, but it is often called the "Demon Star" (Algol is Arabic for "the demon"), because it is in the head of Medusa, and winks or changes its brightness. It is one of the variable stars. Most of the time it is a star of the second magnitude; but every two days, twenty hours, and forty-nine minutes its light begins to fade, and three or four hours later it has lost three-fourths of its brightness, dwindling to nearly a fourth magnitude star. Then it begins to grow brighter, and in three or four hours has regained its former brilliancy. These changes can be detected with the naked eye, and in former times greatly puzzled everybody. In recent times we have learned that a great dark body is circling around Algol, as the moon circles around the earth; only it completes its trip in a little less than three days. In making its circuit it passes between Algol and the earth, and partially obliterates Algol's light.

Now for the myth-story, which is more romantic than that of any other persons among the stars. The main reason, undoubtedly, why the members of the Royal Family were given a place among the stars was the love affair between Perseus and Andromeda. Previous to the time, however, when Perseus found and loved An-

dromeda, his life was filled with adventure. Misfortune had marked him for her own even before his birth.

PERSEUS AND ANDROMEDA

Acrisius, king of Argos, was rich and powerful, but he was not a particularly happy monarch. How could he be? He surely had sufficient cause for unhappiness in the message of Fate which he received through an oracle: "Acrisius shall be slain by the hand of his own grandson." His only child was his daughter, Danaë. They had looked forward to a happy marriage for her, and a prosperous life for her children. Now the king's one desire was to prevent her from being married. He had a tower built of brass, shut his daughter up in it, and placed guards around it, with dire threats of death if they failed in their watch. With all these precautions he hoped to cheat fate. But the will of the gods may not be frustrated. All the king's devices were of no avail. His soldiers might keep sleepless watch through day and through night, but their efforts could not have been less successful if they had striven to prevent the sun from showering his golden beams upon the tower.

When Acrisius learned that Danaë had a baby son, he was much perturbed and very wroth. Still imagining that he might escape the decrees of fate, he did what I think was a craven thing. He sought to save his own life through the death of another person. That that other person was his own daughter will not make his deed any the pleasanter in your estimation. He determined that both his daughter and her son must perish. But even his heart was not frightened enough and cruel

enough to make him willing to stain his hands with the blood of his own family. He hit upon a scheme that appeared to be as effective as simple.

"Make me a large cask," he ordered his carpenter.

"Line it with rugs and shawls," he commanded his upholsterer; for, you see, he was willing to make death as pleasant as he could.

"Place Danaë and her child within the cask," he bade the soldiers of his guard. "Take them in a boat far out from the shore, and toss them into the sea."

He thought certainly in this way they must perish, and his own precious life would be prolonged. He had yet to learn that, though the gods work slowly, they work their will surely.

His behests were obeyed, of course. For he was a powerful king, even though in his madness a cruel one. The cask was thrown to the waves. Hour after hour it rose and fell with them monotonously. I suspect the only thing that saved the mother from insanity was the need of caring for her babe. By what miracle they were preserved alive I am sure I do not know. I only tell the story to you as it was told to me. For days they floated on, the sport of sea and wind. No, not quite sport, either. All the while, a superhuman will was directing their course. The pitying gods caused the cask to be washed ashore on the island of Seriphus. There a kindly fisherman broke it open, and rescued the castaways; and again Danaë felt the good solid earth beneath her feet. He led her to his hut, and he and his good wife provided her with dry, warm clothes and nourishing food, and they kept her there until she had quite recovered from the shock of her terrifying experi-

ence. Then they heard from her the story of all that had happened.

This fisherman, humble as he seemed, was brother to the king of the island. In the course of time, news came quite naturally to the king of the guests in his brother's cottage, and of their marvelous sea-voyage. When he learned that Danaë was the daughter of a king, he made haste to invite her to come and be a guest in the royal palace. Since a king's invitation is much the same thing as a command, Danaë could not well refuse. I have no doubt, however, that she would greatly have preferred to remain in the obscure home of the kind fisherman. But off to the palace she and her son must go.

The years passed on. In the palace of King Polydectes Danaë still lived, with her son, to whom she had given the name Perseus. He had grown to be a young man, and had received the education of a prince of the royal blood. In athletic feats and in the management of weapons of chase and war he surpassed all his companions. Now he was to find that the protection of Polydectes brought hardship with it. The king fell in love with Danaë, and wished to marry her. But she did not love him, and would not consent. He was about to compel her to obey him, when Perseus interfered, saying any man who annoyed his mother must reckon with him. Polydectes, balked in this manner, laid a plan to get rid of Perseus.

"If you are such a splendidly brave fellow," said he to Perseus, "you ought to demonstrate it for us. Let me tell you what you do," he continued tauntingly. "You go and slay the Gorgon Medusa, and bring her head back here. Then, perhaps, we will grant that you have the right to raise your voice when men are present."

Perseus knew very little about what he was undertaking, but he could not pause in the face of such a challenge as that.

"Very well, I'll do it!" he replied, with the rash assurance of youth. "Swear to me that for a year and a day you will secure my mother from all annoyance, and within that time I will return and bring Medusa's head with me."

Then the king lightly made oath, for he was well assured in his mind that long before the twelve months were gone Perseus would be removed from his path forever.

Perseus was at a loss, indeed. He knew that Medusa was one of the Gorgons, but how was he to find her, and what armor would protect him or what sword smite off her head? He went to bed that night very much troubled, you may be sure. As he slept, he had a dream,—that is, he thought it was a dream, but it was really a vision. He dreamed, as it seemed to him, that the eternal gods came down around his couch, and spoke to him, and comforted him. First, there was Mercury, the messenger of the gods, who addressed him, saying:

"What! you are not afraid, are you, Perseus?"

And Perseus would have answered in indignation, but the power of speech seemed to be gone from him. Mercury evidently expected no reply, for without waiting he went on:

"You are now a man, and it is time you should be doing the deeds of a man."

Again the heart of Perseus stirred within him, and he would have been glad to say, if he could have spoken:

"Well, bright stranger, I should just like to know what you call what I have been doing for the last sev-

eral years past? I certainly have not been doing the sweeping or cooking or spinning around here. And there is not a man in all this island who can run faster, or hit harder, or shoot straighter than I can! ”

Mercury apparently thought he had done enough teasing, for he went on in soberer style:

“ The gods, who have watched over you all the time, have prepared great adventures for you. Without our help you could accomplish little; with it you can do anything. And we mean to help you. This Medusa you are to seek and slay, dwells a great distance from here. For all the rapidity of your running, you would need a long time to reach there. Now, I am something of a traveler myself. And I get about as fast as I do because I am the fortunate possessor of a pair of winged sandals.”

Here, lifting his foot and stooping over, Mercury took off a sandal, and first held it up for Perseus to see, and then placed it beside the bed. While he was taking off the other one and placing it beside the first, he went on talking:

“ The wings, you see, are not very large, but I have never had to complain of them yet. They’ll let you walk on the ground, or they’ll carry you through the air, just as you please. I have never tried to see just how fast they will carry me. My uncle Apollo drives the chariot of the sun around the world every day, and pretty frequently I have to outrun his horses to deliver a message to him. I think they’ll carry you faster than—than the fastest runner in this island could run. Try them. I’ll leave them here for you.”

As Mercury turned away, there approached out of the shadows a tall, dark man, whose beard and eyebrows

and hair were inky black, and whose eyes were like wells they were so deep and dark. Just the trace of a smile, caused by the jesting of Mercury, flitted among the wrinkles of his most ancient face. But he was not used to jesting, and evidently dwelt among excessively solemn people. He was all for business.

“ I came from the realm where dwell the souls of the dead ” (and Perseus knew then it was Pluto talking), “ to bring you what you must have in order to find Medusa.”

While he was speaking, Perseus thought he saw him lift a helmet and place it on his head. I say “ thought he saw,” because even as Perseus was still looking at him, suddenly he wasn’t there. Perseus batted his eyes, and looked again; and then, just as suddenly, there stood Pluto again where he had been before.

“ Do you see me now? ” asked Pluto.

And while Perseus was preparing to say “ yes,” behold! Pluto was not there. Two seconds later, he reappeared, and without waiting for any word from Perseus, he explained:

“ This helmet you see in my hand ” (and Perseus really could see it this time) “ is a valuable possession. When you have it on your head, you can be either visible or invisible, as you wish, and as long as you wish. I shall leave it with you. Put on the sandals, wear the helmet, and seek out the Graeae.”

Physical activity comes to all men; and knowledge comes to those who will learn from the experience of men who have lived before them. At last, to a few, comes wisdom, mightiest of all.

As Pluto drew back, and faded into a shadow, the place where he had stood, disappearing and reappearing

so puzzlingly, was taken by Minerva. In the moonlight she looked very gracious and very beautiful to Perseus; and the moonbeams that fell upon the shield she carried were doubled in brilliancy.

“ To slay Medusa, my good Perseus, you will need your own sword, and the sandals of swiftness, and the helmet of invisibility,” she said. “ And you will need still more. Some things must be looked directly in the face when they are attacked. Some must be seen indirectly. This shield, this *Ægis* of mine, which shines so brightly in the moonlight, will serve you as a mirror. When you have found the Medusa, look not directly upon her face, lest calamity befall. Use the shield for a mirror; through it find and slay the monster. Only the Graeae can tell you how to find Medusa, and to find the Graeae you must journey to the northernmost regions of the world.”

Minerva left the shield beside the sandals and the helmet, and passed from sight. However much Perseus desired to stay awake, so soon as his visitors were gone he fell asleep. When he roused in the morning, he found the precious gifts of the gods, and he knew that his dream was not all a dream. He remembered the instructions that had been given him. Probably he tried the sandals, and I suspect he tested the power of the helmet upon his friends, but, as I have said before, the story does not tell. He bade farewell to his mother, and departed on his adventure.

He walked along until he came to a hillside, where no one was in sight. He bound on his sandals and rose up, up into the air. Slowly he went at first, until he gained confidence; then off he went, swifter than a carrier pigeon, swifter than the seven-league boots ever carried

their owner. Straight to the north he flew, on and on for days, till he came to the land of cold and perpetual darkness. Here, he knew, lived the Graeae, of whom he had learned something before he left home. They were three sisters, hideously ugly, old, old women. They were so old (at least, I guess that was the reason) that they had worn out all their eyes but one, and of all their teeth, but a single one remained. This one eye and this single tooth they used each in her turn. Perseus placed his helmet on his head, and with a wish made himself invisible. He stole softly among the three old crones, and he seized the eye just as one of them was handing it to the other. At this mishap to them, which, of course, they did not understand, the Graeae were in sore distress. Perseus then explained that he had snatched the eye from them; but he refused, for all their pleading, to restore it to them until they had told him all about Medusa, and how she was to be found and slain. Medusa was one of another set of three sisters, named the Gorgons. When she was young and beautiful, she prayed to Minerva one day that she might be allowed to leave her home in the dark, cold, hateful north, and go visit the sunshiny south, where people lived. Minerva refused her prayer, and the angry Medusa, in her vanity and pain, cried out that Minerva's refusal was the result of nothing but jealousy and fear lest men should say that Medusa was more beautiful than she. Minerva punished this gross impiety with a punishment that was most terrible. The face of Medusa remained as beautiful as ever, but the long curly locks of her beautiful hair were changed into writhing, hissing snakes, and she became so horrifyingly hideous that whatsoever looked on her head was changed outright into stone.

Perseus left the Graeae, and flew on till he came to where he knew the Gorgons must be. It behooved him to advance circumspectly. Holding his shield above and slightly before him to use as a mirror, he flew on. Carefully, carefully he moved ahead, looking steadfastly upon the Aegis. As great good luck would have it, he came upon the Gorgons while they slept. He approached Medusa, and with a single deft stroke he severed her head. He thought to escape without waking her sisters, but they were roused; and when they perceived from the headless trunk of Medusa what havoc had been wrought upon them, they began a furious pursuit. They faced a double difficulty, however. Perseus was invisible, and his winged sandals bore him along with extreme rapidity in his flight. Off to the south he sped away, and soon he distanced them so far as to be perfectly safe.

The return journey was long and tedious. He encountered many adventures by the way, too many for me to tell you about them. Always he bore the head of Medusa safely out of sight. His journey took him by way of Africa; why, I am sure I do not see, but it did. While he was flying along above the Libyan desert, some drops of blood fell from Medusa's head upon the hot sands, and gave birth to the venomous serpents that infest that region to this day. Again, while he was crossing over a sea, some drops of blood fell upon the waves, and from them Neptune created the Winged Horse, Pegasus. At still another time he was crossing the northwest part of Africa. There he came upon the Titan Atlas, supporting the weight of the heavens upon his shoulders. Through countless years he had supported them in the same way. Now he was very weary.

He saw Perseus coming afar off, and knew he bore Medusa's head with him. He cried to him in a loud voice. When Perseus drew near, Atlas told him of the weary weight and of his desire for rest. He prayed Perseus to give him sight of the head. Perseus drew it forth from the cloak behind him, and held it high before the tired eyes of the giant. Slowly the eyes closed, and, with a last quiver, the enormous body stiffened and hardened into earth and stone. The mighty Titan changed into the mountain range that bears his name still. And the white hair of his aged head became the glittering snow fields and misty clouds that yet hover about the mountain's brow.

Off Perseus flew again, anxious to return to his mother. He drew near the shore of the sounding sea. As he came hurrying along high in air, he beheld a strange sight. A mighty multitude of people were moving back from the shore, beating their breasts and their heads in pity and fright. Perseus stooped nearer to see what they were about. Those who were not hiding their faces in terror, were gazing horror-stricken upon a great rock that jutted out on the seashore. Perseus looked thither, too, but what he saw puzzled him more than ever. For, chained to the rock, stood a beautiful girl, watching in fascination the water before her that churned and splashed inexplicably. Even as Perseus came down to the earth, a huge sea-monster emerged from the waves. The hero did not know then, but he was to learn later, that the young woman chained to the rock was Andromeda, expiating the sin of her mother. Queen Cassiopeia grew vain because of the beauty of her daughter, and boasted rashly that Andromeda was more beautiful than the goddesses of the sea. The indignant goddesses



PERSEUS AND ANDROMEDA

(Illustration by Frank C. Pape from Storrs' "Half a Hundred Hero Tales")

persuaded the gods to punish the mother by sending this fell monster to ravage the dominions of King Cepheus. The king and his counselors besought aid of an oracle, and learned that the evil creature would not be appeased until the mother's sin should be atoned for by the sacrifice of her daughter to its fury. The chaining of Andromeda and the coming of the beast were the fulfillment of the oracle. In the lines of poetry a few pages onward you may read the story of how Perseus lighted beside her and spoke to her; how she bade him flee from the danger that threatened her; and how he fought with the beast, and overcame it, and turned it to a crag among the waves by a sight of the head of Medusa.

Of course, the hero fell in love with the heroine. And when Perseus restored the beautiful Andromeda to her distracted parents, they were so grateful they offered to bestow upon him anything in their might. And what gift would he have of them but Andromeda to be his wife? But

Ay me! for aught that I could ever read,
Could ever hear by tale or history,
The course of true love never did run smooth.

At the very feast given to celebrate the nuptials, a former suitor of the princess came with an army of retainers to claim her for himself, meaning to take her by force if need be. Perseus commanded all who were friendly to him to turn away and hide their eyes. Then he drew Medusa's head from his cloak, and held it aloft. And the boisterous suitor, who had been too great a coward to fight against the sea-monster for Andromeda, was changed into stone, and all his men with him.

When the time came to depart, Perseus took An-

dromeda, his wife, with him, and journeyed on to Seriphus. He came none too soon. The year and a day of his allotted absence were gone by, down to the setting of the sun on the last day. Polydectes had long ago supposed that Perseus was slain. Because he thought himself safe, he was this day persecuting Danaë to force her into obedience to his will. Perseus quickly understood what was going on, and he became so angry that just the minute the opportunity offered itself he plucked out the head of Medusa and held it before the gaze of Polydectes. And then Seriphus needed a new king. Perseus remembered the king's brother, the old fisherman who had been kind to his mother and to him. So he sent for the fisherman to leave his hut and come to the palace; and then and there he had the people swear allegiance to the fisherman as their new king.

After that, he set out with his wife and his mother, and came to Argos. He found turmoil in the land. A usurper had seized upon the throne, and cast the old King Acrisius into prison. Perseus overcame the usurper, and restored his grandfather to the throne. The story ought to end here with an "And they all lived happy ever after." But there was that oracle, "Acrisius shall be slain by the hand of his own grandson." The gods do not forget, and they do not fail. In the games to celebrate the restoration of the aged king, Perseus took his part gleefully. They were playing quoits. The turn of Perseus came. With all his strength he hurled his quoit. By some strange mischance—or was it by the will of the gods?—the quoit swerved from its straight course, and struck Acrisius in the temple. The oracle was fulfilled.

Perseus was so filled with grief at this mishap that he

could not endure to stay near the place. He exchanged his kingdom for another one far removed. There he ruled wisely and kindly, and drew to the end of his days, much loved by his subjects. He had remained ever dear to the gods, and after death he was transferred by them to the stars, and his wife and her parents with him. This story was first told a long, long time ago, but in the heavens the four constellations of the Royal Family still shine, to remind us of the stories of a beautiful woman and a very brave hero.

THE STAR CLUB

I WISH you success with your Star Club. Perhaps your uncles and aunts will start clubs, too. We have three Star Clubs in our family—one in New York, one in Michigan, and one in Colorado. Last winter the "Colorado Star Gazers" sent this challenge to the "New Jersey Night-Owls:" "*We bet you can't see Venus by daylight!*"

That seemed possible, because during that week the "evening star" was by far the brightest object in the sky. But father and daughter searched the sky before sunset in vain, and finally we had to ask the "Moon-struck Michiganders" how to see Venus while the sun was shining. Back came these directions on a postal card: "Wait until it is dark and any one can see Venus. Then find some tree, or other object, which is in line with Venus and over which you can just see her. Put a stake where you stand. Next day go there half an hour before sunset, and stand a little to the west. You will see Venus as big as life. The next afternoon you can find her by four o'clock. And if you keep on you will see her day before yesterday!"

That was a great "stunt." We did it; and there are dozens like it you can do. And that reminds me that Father was mistaken about our interest lasting only two years. We know that it will not die till we do. For, even if we never get a telescope, there will always be new things to see. Our club has still to catch Algol, the "demon's eye," which goes out and gleams forth every three days, because it is obscured by some dark planet we can never see. And we have never yet seen Mira * the wonderful, which for some mysterious reason dies down to ninth magnitude and then blazes up to second magnitude every eleventh month.

Ah, yes, the wonders and the beauties of astronomy ever deepen and widen. Better make friends with the stars now. For when you are old there are no friends like old friends.

—JULIA E. ROGERS: *Earth and Sky Every Child Should Know*. By permission of the publishers, Doubleday, Page and Company.

ANDROMEDA

IN the spray, like a hovering foam-bow,
Hung, more fair than the foam-bow, a boy in the bloom
 of his manhood,
Golden-haired, ivory-limbed, ambrosial; over his shoulder
Hung for a veil of his beauty the gold-fringed folds of
 the goat-skin,
Bearing the brass of his shield, as the sun flashed clear
 on its clearness.

* Mira is in Cetus, a constellation in the southern hemisphere, but visible from northern latitudes.

Curved on his thigh lay a falchion, and under the gleam
of his helmet
Eyes more blue than the main shone awful; around him
Athené
Shed in her love such grace, such state, and terrible
daring.
Hovering over the water he came, upon glittering
pinions,
Living, a wonder, outgrown from the tight-laced gold
of his sandals;
Bounding from billow to billow, and sweeping the crests
like a sea-gull;
Leaping the gulfs of the surge, as he laughed in the joy
of his leaping.
Hovering under her brows, like a swallow that haunts
by the house-eaves,
Delicate-handed, he lifted the veil of her hair; while the
maiden
Motionless, frozen with fear, wept aloud; till his lips
unclosing
Poured from their pearl-strung portal the musical wave
of his wonder.
“ Ah, well spoke she, the wise one, the gray-eyed Pallas
Athené,—
Known to Immortals alone are the prizes which lie for
the heroes
Ready prepared at their feet; for requiring a little, the
rulers
Pay back the loan tenfold to the man who, careless of
pleasure,
Thirsting for honor and toil, fares forth on a perilous
errand

Led by the guiding of gods, and strong in the strength
of Immortals.

Thus have they led me to thee: from afar, unknowing, I
marked thee,

Shining, a snow-white cross on the dark-green walls of
the sea-cliff;

Carven in marble I deemed thee, a perfect work of the
craftsman.

Curious I came, till I saw how thy tresses streamed in
the sea-wind,

Glistening, black as the night, and thy lips moved slow
in thy wailing.

Speak again now—Oh, speak! For my soul is stirred to
avenge thee;

Tell me what barbarous horde, without law, unrighteous
and heartless,

Hateful to gods and to men, thus have bound thee, a
shame to the sunlight,

Scorn and prize to the sailor: but my prize now; for a
coward,

Coward and shameless were he, who so finding a glorious
jewel

Cast on the wayside by fools, would not win it and keep
it and wear it,

Even as I will thee; for I swear by the head of my
father,

Bearing thee over the sea-wave, to wed thee in Argos
the fruitful,

Beautiful, meed of my toil no less than this head which
I carry,

Hidden here fearful—oh speak! ”

Then, like a fawn when startled, she looked with a
shriek to the seaward.

“ Touch me not, wretch that I am! For accursèd, a
shame and a hissing,
Guiltless, accurst no less, I await the revenge of the
sea-gods.

Yonder it comes! Ah go! Let me perish unseen, if I
perish!

Spare me the shame of thine eyes, when merciless fangs
must tear me

Piecemeal! Enough to endure by myself in the light of
the sunshine,

Guiltless, the death of a kid! ”

But the boy still lingered around her,
Loath, like a boy, to forego her, and waken the cliffs
with his laughter.

“ Yon is the foe, then? A beast of the sea? I had
deemed him immortal;

Kiss me but once, and I go.”

Then lifting her neck, like a sea-bird
Peering up over the wave, from the foam-white swells
of her bosom,

Blushing she kissed him: afar on the topmost Idalian
summit

Laughed in the joy of her heart, far-seeing, the queen
Aphrodité.

Loosing his arms from her waist he flew upward, await-
ing the sea-beast.

Onward it came from the southward, as bulky and black
as a galley,

Lazily coasting along, as the fish fled leaping before it;
Lazily breasting the ripple, and watching by sandbar
and headland,

Listening for laughter of maidens at bleaching, or song
of the fisher,

Children at play on the pebbles, or cattle that pawed on
the sandhills.

Rolling and dripping it came, where bedded in glistening
purple

Cold on the cold sea-weeds lay the long white sides of
the maiden,

Trembling, her face in her hands, and her tresses afloat
on the water.

As when an osprey aloft, if he see on a glittering
shallow

. the fin of a wallowing dolphin,
Falls from the sky like a star, while the wind rattles
hoarse in his pinions:

Over him closes the foam for a moment; then from the
sand-bed

Rolls up the great fish, dead, and his side gleams white
in the sunshine:

Thus fell the boy on the beast, unveiling the face of the
Gorgon;

Thus fell the boy on the beast; thus rolled up the beast
in his horror,

Once, as the dead eyes glared into his; then his sides,
death-sharpened,

Stiffened and stood, brown rock, in the wash of the wan-
dering water.

Beautiful, eager, triumphant, he leapt back again to
his treasure;

Leapt back again, full blest, toward arms spread wide to
receive him.

Brimful of honor he clasped her, and brimful of love she
caressed him,

Answering lip with lip; while above them the queen
Aphrodité

Poured on their foreheads and limbs, unseen, ambrosial
odors,
Givers of longing, and rapture, and chaste content in
espousals.
Happy whom ere they be wedded anoints she, the Queen
Aphrodité!
Then on the brows of the maiden a veil bound Pallas
Athené;
Ample it fell to her feet, deep-fringed, a wonder of
weaving.
Ages and ages ago it was wrought on the heights of
Olympus,
Wrought in the gold-strung loom, by the finger of cunning
Athené.
In it she wove all creatures that teem in the womb of
the ocean—
Nereid, siren, and triton and dolphin, and arrowy
fishes
Glittering round, many-hued, on the flame-red folds of
the mantle.
In it she wove, too, a town where gray-haired kings sat
in judgment;
Scepter in hand in the market they sat, doing right by
the people,
Wise: while above watched Justice, and near, far-seeing
Apollo.
Round it she wove for a fringe all herbs of the earth
and the water,
Violet, asphodel, ivy, and vine-leaves, roses and lilies,
Coral and sea-fan, and tangle, the blooms and the palms
of the ocean:
Now from Olympus she bore it, a dower to the bride of a
hero.

Over the limbs of the damsel she wrapt it: the maid still
trembled,
Shading her face with her hands; for the eyes of the
goddess were awful.
Then, as a pine upon Ida when southwest winds blow
landward,
Stately she bent to the damsel, and breathed on her: un-
der her breathing
Taller and fairer she grew; and the goddess spoke in
her wisdom.
“ Courage I give thee; the heart of a queen, and the
mind of Immortals;
Godlike to talk with the gods, and to look on their eyes
unshrinking;
Fearing the sun and the stars no more, and the blue
salt water;
Fearing us only, the lords of Olympus, friends of the
heroes;
Chastely and wisely to govern thyself and thy house and
thy people,
Bearing a godlike race to thy spouse, till dying I set thee
High for a star in the heavens, a sign and a hope to the
seamen,
Spreading thy long white arms all night in the heights
of the aether,
Hard by thy sire and the hero thy spouse, while near
thee thy mother
Sits in her ivory chair, as she plaits ambrosial tresses.
All night long thou wilt shine; all day thou wilt feast on
Olympus,
Happy, the guest of the gods, by thy husband, the god-
begotten.”

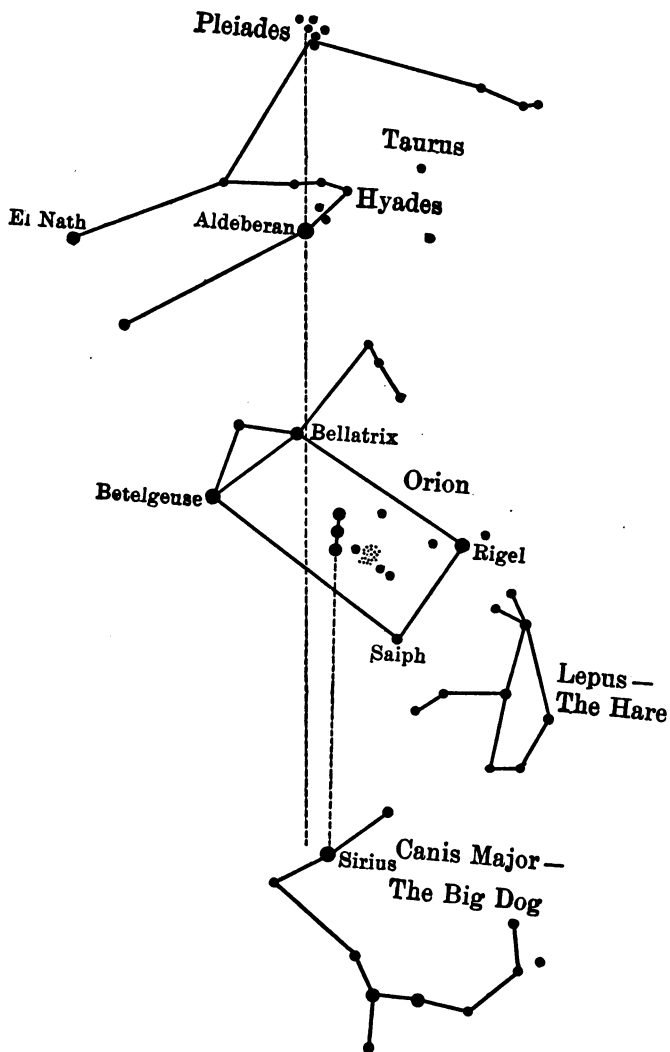
—CHARLES KINGSLEY.

THE ORION GROUP

ORION—TAURUS—SIRIUS
LEPUS—ARGO

Farther to the south and east than Perseus will rise the Orion Group. A line drawn from Polaris through the eastern part of the constellation of Perseus will pass very near the Pleiades in Taurus. These constellations can be seen at their best in January and February when they are nearly overhead, although Orion comes chasing Taurus into the night sky in December. Orion, Sirius, and Taurus can still be seen, in April, low down in the west.

Orion's sword is usually drawn parallel to the belt, not up and down as the line of stars that mark the sword would indicate.





Many a night from yonder ivied casement, ere I went to rest,
Did I look on great Orion sloping slowly to the West.
Many a night I saw the Pleiads, rising thro' the mellow shade,
Glitter like a swarm of fire-flies tangled in a silver braid.

—TENNYSON: *Locksley Hall*.

ORION

IN the olden times an aged and lonely man sat at the door of his hut one day, bemoaning to himself the fact that he was alone in the world. He had no near neighbors, and everything that was done he had to do for himself. He had lived alone for a long while, hunting and fishing. While he was strong, he had no care. But as he felt the weakness of age stealing upon him, he began to think with dread of the helplessness of the very old, and to grieve that he had neither a son nor a daughter.

As he sat muttering to himself, he looked up and was surprised to see before him three strangers. His ears were good, but he had heard no noise of footsteps. He was startled, but not frightened. He saw they meant to visit him, and so he arose and greeted them courteously. The three strangers replied gravely and kindly, and upon his invitation entered the hut, where they were made as comfortable as might be. The old man wondered what in the world could bring the strangers to this lonesome place, and how they could have come, for they looked entirely too little fatigued to have traveled far; but he felt that courtesy did not permit him to question them on these matters.

Instead, he busied himself to wait on them. He brought cold spring water for them to drink, and would have offered them water to bathe their hands and faces and their feet, but their utter freedom from the weariness of travel caused him to hesitate. While

he paused, the youngest and most beautiful of the three spoke. His forehead was like the clouds of dawn for whiteness, his cheeks flamed with the rosy red of sunset, his eyes were blue as the summer noon, and his hair tumbled about his shoulders in masses dark and rich as clouds of winter storm. His words were simple, but they were soothing, and flowed on like the music of the wind sighing in the tree tops. And as he spoke, the hut grew brighter, and filled with an opal light. The aged huntsman was abashed at the change, and knew not what to do.

Then the tallest of the three, the one who seemed to be the leader, saw the awe in the simple man's face, and reassured him, saying,

"Have no fear. We came but to share your hospitality. What was it you were saying when we drew near the cottage?"

His voice was deep, and like the pealing of an organ heard afar off.

When the huntsman heard, he feared no longer, but was like one in a dream, whose will is not his own. Very simply he replied, and told them of his dread of the helplessness of old age, when it should come and find him with no son and no daughter, no one to serve him.

"Again I say, have no fear," repeated the leader of the strangers. "You shall have your wish. For that reason have we come to visit you."

And then the old man, looking upon him, understood. That lofty brow, that flowing beard, those beneficent eyes, he could not mistake. He was in the presence of Jove, father of gods and men. And when he knew the gods, he bowed himself, and worshiped them.

“Naught have I worthy,” he declared, “save a single ox, but that will I sacrifice unto you.”

To test him, Jupiter permitted him to build an altar in his yard, and sacrifice the ox upon it. And the gods were well pleased with the old man's service. When they were ready to depart, Jupiter bade him take the ox-hide and bury it in the ground. And though the aged man little knew what it could mean, he joyfully obeyed the command, for he held that the gods would not fail of their promise, they would surely give him what he wished for most.

Next morning, wondering whether the previous day was not all a dream, the aged huntsman looked out of his door toward the mound of the buried ox-hide, and hardly knew whether to believe his eyes or to believe that he was still dreaming, so astounded was he when he saw a small boy walking from the mound directly towards him. But the gods had kept their word: the boy was real enough.

The pious huntsman took the boy into his hut, gave him the name Orion, and treated him as his own child; indeed, he was his own child, for in this manner the gods had given him a son. He cared for him, watched him grow strong, taught him all the lore of forest and hillside. Orion thrived apace, and grew big of bone and muscle. Soon he was larger than his father; and his heart was big as well as his body. He remained with his father, protecting him through all the decrepitude of old age, caring for him patiently and tenderly until death came.

Orion had continued to grow in size and strength, passing beyond human stature; he was now become a giant, as we might naturally have expected of one who

was born of the earth, as he was. When his father was no more, Orion allowed the hunt to lead him farther and farther away from home. He was young, he was strong; the blood ran red in his veins. Daily his merry halloo and the deep baying of his favorite hunting-dog roused the echoes in some new dell or nook of the vale of Tempe or the dales of Arcady.

The hunt led him one day into the most beautiful valley he had ever seen. Ancient trees spread wide their boughs above a turf so green and soft that his feet sank ankle-deep. Blue flowers lifted their faces and nodded to the breezes and the flecks of sunshine that fell through the leaves of the trees. The song of the birds was made sweeter by the tinkling chorus of a brook that babbled somewhere out of sight. Not Venus herself could have chosen a lovelier spot for her maidens to sport in. Orion forgot the chase, forgot Sirius, and wandered on rejoicing in the serenity and the fragrance of the place, until he was roused from his musing thoughts by the sound of the gleeful voices of girls at play. Following the sounds, he passed around a mass of young trees curtained with blossoming vines, and came upon the edge of a meadow fair and smooth, where he stopped stock-still.

Well might he think he saw there before him the goddess of love and her attendant nymphs. He stood long, gazing silently upon them, as in and out they wove happily through the mazes of a dance. Never, never, had he seen creatures more beautiful than these seven tall and lissome maidens. As they danced they tossed a ball from one to another, and their hair and gossamer robes fluttered in the breeze. To the entranced Orion, their very bodies, swaying rhythmically, seemed to make

music; he was quite sure their voices did. He would willingly have stood forever, looking and listening, could the damsels but have stayed too, dancing and laughing and singing before him. But joy ever makes haste to slip away. One of the maidens missed the ball and it flew past her, straight toward Orion. The tender-hearted youth, with never a thought of frightening them, stooped and picked up the ball, meaning to return it that they might resume their play. The whole merry troop had started after it, but when they saw Orion so close upon them, they stopped abruptly, hovering for one single second, like a bevy of partridges surprised by a hunter in a field of corn. Then, as sudden as the whirl of partridges' wings, they wheeled and fled away. Orion had not the slightest desire to harm any one of them, but he was too much enamored of their loveliness willingly to lose sight of them. He ran in pursuit of them. Away and away they sped. And he followed fast. Always by as much as he drew near to them, by so much did they increase their speed; and the faster they ran, the oftener he redoubled his effort to overtake them. Long and far the chase continued. The nymphs were sorely distressed, but on they struggled. Often they besought the gods for aid; finally, in agony, they prayed to be turned to birds so that they might escape. The gods granted their prayer, and changed them into doves. But they were dear to the gods, for they were the daughters of Atlas, the giant, who supported on his mighty shoulders the heavens, keeping them from falling and crushing both gods and men. In gratitude, the gods permitted the daughters of Atlas, now changed into doves, to fly on up into the sky, where, through a second change, they were trans-

formed into the group of stars called the Pleiades, a constellation as beautiful as Orion thought the maidens he chased.

The disappointed lover may have continued to seek for the maidens, not knowing that they were gone from the earth forever. Perhaps he went day after day to the beautiful meadow. I think it very probable that he did, but the story does not say, and I can not tell. If he did, it mattered not how quietly he might approach, he found the place deserted; never again might he see their jocund dance or hear their laughter resounding there. When finally he knew that his search was futile, he resumed his hunting. Again Sirius filled the woods with the din of his baying till they echoed and re-echoed. The disconsolate lover hunted stag and wild boar until, in the joy of the chase, he forgot his grief. Farther and ever farther he wandered; and as the months passed by, his fame spread, too; he became known as a mighty hunter.

One day he came to the island of Chios. There he heard of Oenopion, the king; and it was reported to him that Oenopion had a daughter who was very, very beautiful. Orion wondered if she was as beautiful as the Pleiades he had seen. He made way to the capital city, and sought out the palace that he might see for himself. Right well disconcerted was the porter at the palace gate when he saw the giant approach.

"Ho! mighty man!" he said; "come you in peace or in war? What seek you?"

Now, the porter of the king's palace was himself a tall, strong man, a great warrior in the country's army; but beside Orion he looked like a child.

"In peace," answered Orion. "I would speak with

your king, and see his daughter, for it has been told me that she is the most beautiful woman in the world."

"Oh! say you so! And who are you, that you——"

But the porter got no further in his impudent reply; for Orion was not used to being crossed in his will, and now he lifted his arm as if he meant to strike. Whereupon the porter decided suddenly that politeness is best towards strangers.

"Come you within, stranger," he said obsequiously. "Give me your name and say what land you come from, that I may tell the king who wishes to see him."

Orion was easily mollified; so he answered the man's questions, and sent him off to seek Oenopion.

You may readily believe that when the king heard what a giant had come to visit him, Orion was not kept long in waiting. The porter returned presently, and conducted Orion to the great hall of the palace, where the king sat, surrounded by his courtiers and his warriors. Orion had to stoop to enter the doorway, and when he was inside, he seemed almost to fill the hall with his bulk, he was so big. He must have appeared very odd to the finely clad men there, as he stalked forward, his brawny body clothed in the skin of a lion and his enormous arms and legs bare. The king greeted him courteously, bade him be seated near his royal self, and entered into conversation with him. He asked questions concerning many things; and Orion answered simply and with dignity; he was not in the least abashed, for it had never entered into his big simple heart to think of himself as the inferior of any man. When the day had worn on, and night came, serving-men placed tables about, and a feast was prepared. And when the king and his guests had feasted, and it came time to serve

wine, the king's daughter came into the hallway; she took a beaker from her father's table, and when a servant had poured wine into it, she gave it first to her father, and afterwards to Orion. Before he drank of it, Orion looked upon her, as she stood there before him in the torchlight. She seemed very stately, and fair, and beautiful after the fashion of beauty of the Greek women. As Orion drank of the best wine he had ever tasted, for Chios is famous for its wine, it certainly lost nothing of its savor because it came to him from the hand of this tall and erect princess. And as he looked upon her, he loved her. Gone was the memory of the Pleiades. He forgot he had come to see if the princess was as beautiful as they. He forgot to make any comparison. He only knew that Merope was beautiful, and that he loved her.

King Oenopion was not greatly prepossessed with Orion—indeed, he rather feared him, for all his gentle disposition; but he invited him to remain as his guest. And Orion stayed on, for he loved Merope, the king's daughter; and he thought she looked not with disfavor upon him. After several days had passed by, Orion asked Oenopion for the hand of his daughter in marriage. Now was the king highly displeased. He did not approve of Orion for a son-in-law, though why, I am sure, I do not know. I suspect that there was a streak of cowardice in him, and that he feared Orion might somehow endanger his throne. He would much rather have seen Orion gone from the country, or dead, than married to his lovely daughter. He was afraid to say as much, however, to Orion; so made first one excuse and then another. Orion insisted. Then the king replied that word had been brought him of the ravages

of a fierce wild boar in a corner of his kingdom; the people were in distress, and had sent for help. Of course, he said, the king's daughter could not be married with feasting and merry-making while the king's subjects were in peril. If Orion, who claimed to be such a marvelous hunter, would slay the boar, then, perhaps, the marriage might be discussed. Orion went and slew the boar with hardly any trouble at all, and soon returned, bringing the tusks as trophies for Merope. He thought that now surely he had won the favor of the king. But he was mistaken. Oenopion disliked him more than before. Instead of consenting to his wedding Merope, he set him still other tasks. Orion cleared the whole island of wild beasts and monsters, and brought the spoils to the princess. Oenopion, however, distrusted him, and hated him still. Despairing of being rid of the giant in any other way, he made him drunk with wine one day, and while Orion was in this helpless condition the king had his eyes put out, and then made the royal servants carry him out to the seashore, hoping, I suspect, that, drunk and blind, the waves would drown him.

In his desperate condition, Orion hardly knew what to do. He sought the advice of an oracle, and was instructed to procure the aid of certain blacksmiths, who, like himself, were giants. He set off to wander again, and traveled till he came to Lemnos, where he heard the sound of hammers striking on an anvil. He followed the sound, and came where he found Vulcan, the blacksmith god, and his attendants at work. Vulcan pitied him, and gave him Cedalion, one of the Cyclops, for a guide. Orion placed Cedalion upon his shoulders, and traveled towards the mountains of the east until he met

the god of the sun, who caused the first rays of the morning sun to fall upon the blinded eyes, and restored the power of sight to the giant.

Orion went back to his old life of hunting. Whether he still loved and remembered Merope or not, I can not tell you. But certain it is, as I learned the tale, that while hunting in a new country, he encountered a maiden more lovely than any he had yet seen. This was the goddess Diana, even more famed as a huntress than he as a hunter. It is not told in the story that he fell in love with her, but she was pleased with him, and showed him marked favor. Often they followed the chase together. In the end, news of this came to Apollo, the brother of Diana, and he became alarmed lest she should love Orion and desire to marry him. Now Diana had sworn never to marry, and it is a terrible thing for a god or a goddess to break an oath. Such a catastrophe Apollo determined to prevent, no matter how much suffering he might cause.

One day, while they were walking along the shore of the sea, he began to tease his sister, saying he did not believe she could shoot so well as she was famed to do.

“Try me,” she exclaimed.

“Very well, I will,” Apollo rejoined. “Do you see that black speck floating yonder far out on the waves? I dare you to try to hit it.”

The huntress queen lifted her silver bow, fitted a shaft, and, with an aim that looked almost careless, shot her arrow swift and true. The speck sank, and reappeared no more. Alas! it was but a sorry jest Apollo had played. That speck was the head of Orion, who had been sporting in the waves. When Diana learned that she had slain her favorite, she was sorely grieved.

But grief and tears could not restore life to the dead. The best she could do was to place Orion as a constellation among the stars.

And there he appears, visible to you and me to this day, the most splendid of all the constellations. You can most readily find him in the autumn,—starting in the east early in the evening, and following the chase across the sky through the night,—a giant with girdle, sword, lion's skin, and club. The Pleiades flee before him, ever pursued, never caught. And always following close at his heels is his faithful dog, its mouth made of the wonderful star Sirius, the Dog Star, the brightest in the heavens.

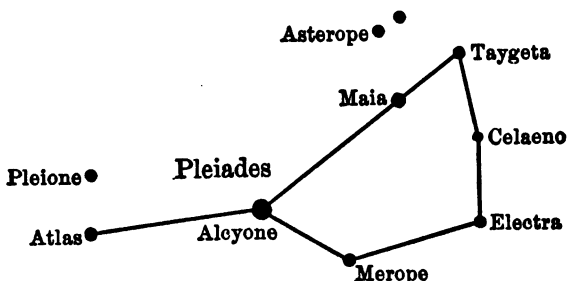
When, with the aid of your charts, you have found the constellation of Orion, to the south and east of Perseus, you will never fail to recognize it afterwards. It contains two first magnitude stars, Betelgeuse and Rigel, that seem to be balanced against each other. Both are tremendous suns, probably thousands of times brighter than our sun, and so far away from us that no astronomer has succeeded in even estimating their distance. Between them lie three stars, almost in a straight row, that match each other in brilliancy and tint as perfectly as if they were selected gems. They are in Orion's belt, and below them hangs the hunter's sword, a line of fourth and fifth magnitude stars. Betelgeuse and Bellatrix are in his shoulder, and Rigel is in his uplifted foot. With club aloft in his right hand, and the skin of a lion for a shield on his left arm, Orion seems to be awaiting Taurus, who charges down upon him from the northwest, only to be driven forever backwards across the sky.

The fiery Aldebaran, in the right eye of Taurus, is a first magnitude star in the cluster forming a V along the nose of Taurus, and called the Hyades. The Hyades were nymphs, the daughters of Atlas, into whose care Jove intrusted the infant Bacchus, and whose fidelity was so great that he rewarded them by giving them a place in the sky. The Hyades have always been associated with rainy weather.

Another cluster in Taurus is, perhaps, the most celebrated group among the stars, the lovely Pleiades—"Though small their size and pale their light, wide is their fame." In all ages and all countries the Pleiades have been watched and wondered at. By many tribes they have been associated with religious rites, and numberless myths have grown up about them. Often they are known as the Seven Stars or the Seven Sisters, although most people can see only six. One of the stars may have been brighter at some time, because the story of the lost Pleiad is known far and wide. In our rare and delightful Texas atmosphere, which rivals that of Italy and Egypt, I have counted more than seven with the naked eye.

There has always seemed to be a misty light about them that did not come from the visible stars themselves; and at last photography has revealed the fact that a vast nebula surrounds the Pleiades, seeming to connect them as one great system in the formative stage. They are so vastly far from us that we have no idea how great the distance is, but it requires more than a hundred years for their light to reach us. The Pleiades chart, which is on a much larger scale than our other charts, will show you their positions and their names.

You will notice that the main stars form a short-handled dipper, and sometimes people who do not know the constellations wonder if they are the "Little Dipper."



Going back to Orion, and following the line made by the stars in his belt to the southeast, you will find Sirius, the most brilliant and the most fascinatingly beautiful of all the stars. It is in the mouth of Orion's Dog, as we have already learned. Not far away, at the feet of Orion, is Lepus, the Little Hare, which is always being chased by the Dog, but, of course, never caught.

South of Sirius, but not visible from much of the northern hemisphere, is Argo, the ship in which Jason sailed away in search of the Golden Fleece. Its most brilliant star, Canopus, can sometimes be seen from middle and southern Texas, shining beautifully low down in the south. Canopus is second only to Sirius in magnitude, but it is vastly farther away from us than Sirius is. Professor Simon Newcomb places it among those stars whose intrinsic brilliancy exceeds that of the sun *at least ten thousand times*. If Canopus is ten thousand times more brilliant than the sun, and Sirius is forty times more brilliant than the sun, how much

brighter than Sirius is Canopus? If you assume that the size is in proportion to the brilliancy, how far would Canopus stretch beyond the earth, if its center were placed where the center of the sun now is?

ASTROLOGY

IN the early civilizations, before knowledge had revealed that the stars were vastly distant from us and made of material like our own sun, the people, in trying to explain the workings of the universe, decided that the stars exerted a great influence upon the destiny of man. The astrologers, the men who read the stars, contended that the positions of the stars at the time of a child's birth influenced his whole life. According as he was born under a star lucky or ill-omened, so his life would be successful or ill-favored. The astrologers were consulted about all enterprises, and no step of importance was taken until the stars indicated success.

Many of our words have been derived, through astrology, from the names of stars that were supposed to shed certain influences; thus, *saturnine* from Saturn, *mercurial* from Mercury, and *jovial* from Jupiter; *disaster* means the disfavor of the stars, and *consider* means to consult the stars.

"The oldest astrologers we know of were the Chaldeans, and star-reading was carried from them to the Egyptians and Babylonians. It marched in triumph through Greece and the Roman Empire, and in the latter part of the Middle Ages it held its own in the rest of Europe as well. The Arabians, Persians, and Chinese were past masters in the art of star-reading, and even up to a few years ago Imperial astrologers

were still on duty at the Peking court. Chairs of astrology were established at the old universities in Southern Europe, and only abolished about the middle of the seventeenth century; whilst kings and princes of those days showed greater preference for the pronouncements of star-gazers than for those of more competent persons."—B. H. BÜRGEI: *Astronomy for All*.

While we have not had official astrologers "even up to a few years ago," like the Chinese, yet in the last two years one of our popular magazines has planted a rank weed in a great many homes by publishing a series of articles purporting to explain the influence of the stars. Why should the stars, which are all inanimate masses of matter, have control of our nervous systems or of our destinies, any more than does the brick or wood or stone in the house in which we live? Who believes that he is courageous or weak of heart according as there was an oak or a willow in the yard of the home where he was born? There is as much reason to believe this as to believe that stars influence us. If the people who conceived of astrology had understood the nature of these suns in space as we now know them, astrology would never have been. The scientists and all thinking persons have long known that astrology is the merest superstition, with only its historical interest to give it any claim whatever upon our consideration.

TAURUS

THE Scorpion's stars crawl down behind the sun,
And when he drops below the verge of day,
The glittering fangs, their fervid courses run,
Cling to his skirts and follow him away.

Then, ere the heels of flying Capricorn

Have touched the western mountain's darkening rim,
I mark, stern Taurus, through the twilight gray

The glinting of thy horn,

And sullen front, uprising large and dim,
Bent to the starry hunter's sword, at bay.

Thy hoofs, unwilling, climb the spherie vault;

Thy red eye trembles with an angry glare,
When the hounds follow, and in fierce assault
Bay through the fringes of the lion's hair.

The stars that once were mortal in their love,
And by their love are made immortal now,
Cluster like golden bees upon thy mane,

When thou, possessed with Jove,
Bore sweet Europa's garlands on thy brow,
And stole her from the green Sicilian plain.

Type of the stubborn force that will not bend

To loftier art,—soul of defiant breath
That blindly stands and battles to the end,
Nerving resistance with the throes of death,—

Majestic Taurus! when thy wrathful eye
Flamed brightest, and thy hoofs a moment stayed
Their march at Night's meridian, I was born:

But in the western sky,
Like sweet Europa, Love's fair star delayed,
To hang her garland on thy silver horn.

Thou giv'st that temper of enduring mold,

That slights the wayward bent of Destiny,—
Such as sent forth the shaggy Jarls of old
To launch their dragons on the unknown sea:

Such as keep strong the sinews of the sword,
The proud, hot blood of battle,—welcome made
The headsman's axe, the rack, the martyr-fire,
The ignominious cord,
When but to yield, had pomps and honors laid
On heads that molder in ignoble mire.

Night is the summer when the soul grows ripe
With Life's full harvest: of her myriad suns,
Thou dost not gild the quiet herdsman's pipe,
Nor royal state, that royal actions shuns.
But in the noontide of thy ruddy stars
Thrive strength, and daring, and the blood whence
springs
The Heraclidean seed of heroes; then
Were sundered Gaza's bars;
Then, 'mid the smitten Hydra's loosened rings,
His slayer rested, in the Lernean fen.

Thine is the subtle element that turns
To fearless act the impulse of the hour,—
The secret fire, whose flash electric burns
To every source of passion and of power.
Therefore I hail thee, on thy glittering track:
Therefore I watch thee, when the night grows dark,
Slow-rising, front Orion's sword along
The starry zodiac,
And from thy mystic beam demand a spark
To warm my soul with more heroic song.

—BAYARD TAYLOR.

THE LOST PLEIAD

AND is their glory from the heavens departed?
—Oh! void unmark'd!—thy sisters of the sky
Still hold their place on high,
Though from its rank thine orb so long hath started,
Thou, that no more art seen of mortal eye.

Hath the night lost a gem, the regal night?
She wears her crown of old magnificence,
Though thou art exiled thence—
No desert seems to part those urns of light,
'Midst the far depth of purple gloom intense.

They rise in joy, the starry myriads burning—
The shepherd greets them on his mountains free;
And from the silvery sea
To them the sailor's wakeful eye is turning—
Unchanged they rise, they have not mourn'd for thee.

Couldst thou be shaken from thy radiant place
Even as a dew-drop from the myrtle spray,
Swept by the wind away?
Wert thou not peopled by some glorious race,
And was there power to smite them with decay?

Why, who shall talk of thrones, of scepters riven?
Bow'd be our hearts to think of what *we* are,
When from its height afar
A world sinks thus—and yon majestic heaven
Shines not the less for that one vanish'd star!

—MRS. FELICIA HEMANS.



THE PLEIADES

(From photograph by Herbert C. Wilson taken with eight-inch photographic telescope, exposure 7 hours)

ORION

How oft I've watch'd thee from the garden croft,
In silence, when the busy day was done,
Shining with wondrous brilliancy aloft,
And flickering like a casement 'gainst the sun!
I've seen thee soar from out some snowy cloud,
Which held the frozen breath of land and sea,
Yet broke and sever'd as the wind grew loud—
But earth-bound winds could not dismember thee,
Nor shake thy frame of jewels; I have guess'd
At thy strange shape and function, haply felt
The charm of that old myth about thy belt
And sword; but, most, my spirit was possess'd
By His great Presence, Who is never far
From His light-bearers, whether man or star.

—CHARLES TENNYSON TURNER.

CANOPUS

THE Star of Egypt, whose proud light
Never hath beamed on those who rest
In the White Islands of the West.

—MOORE: *Lalla Rookh*.

Canopus shining down over the desert, with its blue diamond brightness (that wild, blue, spirit-like brightness, far brighter than we ever witness here), would pierce into the heart of the wild Ishmaelitish man, whom it was guiding through the solitary waste there. To his wild heart, with all feelings in it, with no *speech* for any

feeling, it might seem a little eye, that Canopus, gleaming out on him from the great, deep Eternity; revealing the inner Splendor to him.

Cannot we understand how these men *worshipped* Canopus; became what we call Sabeans, worshipping the stars?

To us, also, through every star, through every blade of grass, is not a God made visible, if we will open our minds and eyes?

We do not worship in that way now: but is it not reckoned still a merit, proof of what we call a "poetic nature," that we recognize how every object still verily is "a window through which we may look into Infinitude itself?"

—CARLYLE: *Heroes and Hero-Worship*.

CANOPUS

ABOVE the palms, the peaks of pearly gray

That hang, like dreams, along the slumbering skies,
An urn of fire that never burns away,
I see Canopus rise.

An urn of light, a golden-hearted torch,
Voluptuous, drowsy-throbbing mid the stars,
As, incense-fed, from Aphrodite's porch
Lifted, to beacon Mars.

Is it from songs and stories of the Past,
With names and scenes that make our planet fair,—
From Babylonian splendors, vague and vast,
And flushed Arabian air:—

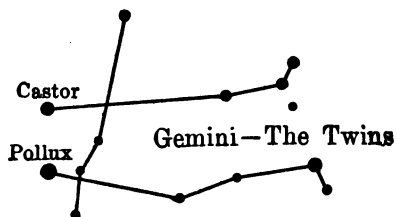
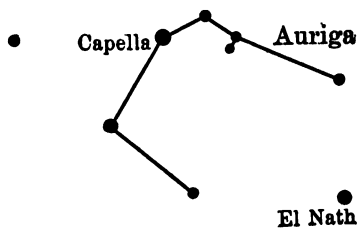
Or sprung from richer longings of the brain
And spices of the blood, this hot desire
To lie beneath that mellow lamp again
And breathe its languid fire?

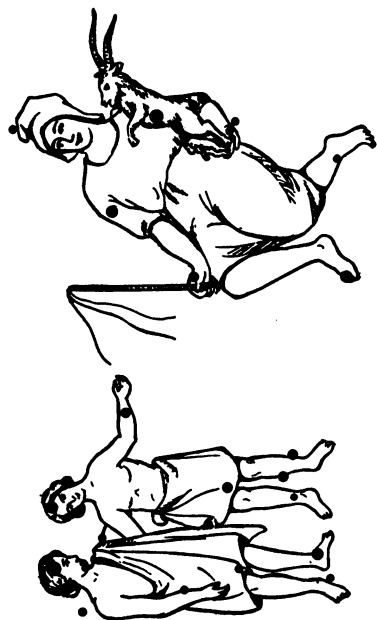
—BAYARD TAYLOR.

AURIGA AND GEMINI

THE CHARIOTEER AND THE TWINS

At the same time of the year in which Orion is in our night sky, farther to the north are the constellations of Auriga and the Twins. They are in the east in December and overhead in February. When we see them last, they are low down in the west in June.





AURIGA (THE CHARIOTEER)

Thou hast loosened the necks of thine horses, and goaded their
flanks with affright,
To the race of a course that we know not, on ways that are hid
from our sight.
As a wind through the darkness the wheels of their chariot are
whirled,
And the light of its passage is night on the face of the world.

—A. C. SWINBURNE.

AURIGA AND GEMINI

RISING at the same season of year with Aldebaran and the Pleiades, and just before Castor and Pollux, is another first magnitude star—Capella, the Goat, which is between Orion and Polaris, and can easily be found by its brightness. The constellation to which it belongs is known as Auriga, the Charioteer, and has come from such remote ages that its myth has become confused. The figure is represented as “a mighty man seated on the milky way.” In his right hand is a whip. His right foot rests upon El Nath, which is the tip of Taurus’s horn, and common to both constellations. On Auriga’s left arm rests the Goat, with Capella in its heart. Capella is a tremendous sun, and, according to Professor Newcomb, is about one hundred and twenty times greater than our sun in actual magnitude.

About half-way between Sirius and the Pointers you will find the bright twin stars, Castor and Pollux, in the constellation of the Twins, or Gemini. They come up in the East about the same time as Betelgeuse and Rigel, but are much farther north. In May and June Castor and Pollux are especially attractive, as they hang low in the northwest, shining out from a glowing sunset sky.

In the constellation charts, Pollux is the Beta and Castor the Alpha, although Pollux is the brighter of the two.* It is thought that Castor may have been the

*See p. 255.

brighter three hundred years ago, and that it is losing its brilliancy as it recedes from us. Then, too, Pollux is coming towards us; so it is growing brighter.

The twin brothers, Castor and Pollux, distinguished themselves in hunting. Castor was a mortal, but Pollux was the son of a god. One day Castor was slain in a combat. Pollux in his grief implored Jupiter to allow him to die also, that he might be with his brother. Jupiter was so touched that he permitted Castor to return to life, if Pollux would spend half of his time in Hades. Later they were translated to the sky, where their bright stars, one in the forehead of each, can be seen shining close together.

The Romans were very partial to the "Great Twin Brethren," and believed that they often led their legions on to success in wars. They built temples to them, and had great feasts in their honor. The sailors also considered the sign of The Twins as an assurance of fair weather and a successful voyage, not infrequently naming their ships after them. St. Paul tells us in Acts xxviii, 11, "After three months we departed in a ship of Alexandria which had wintered in the isle, whose sign was Castor and Pollux."

TO CASTOR AND POLLUX

A translation from Homer which shows what the old Greeks thought of Castor and Pollux.

SING the Twins of Jove, mild Pollux, void of blame,
And steel-subduing Castor, heirs of fame.
These are the Powers who earth-born mortals save
And ships, whose flight is swift along the wave.

When wintry tempests o'er the savage sea
Are raging, and the sailors tremblingly
Call on the Twins of Jove with prayer and vow,
Gathered in fear upon the lofty prow,
And sacrifice with snow-white lambs,—the wind
And the huge billow bursting close behind
Even then beneath the weltering waters bear
The staggering ship,—they suddenly appear,
On yellow wings rushing athwart the sky,
And lull the blasts in mute tranquillity,
And strew the waves on the white Ocean's bed,
Fair omen of the voyage; from toil and dread
The sailors rest, rejoicing in the sight,
And plow the quiet sea in safe delight.

—SHELLEY (Adapted).

THE BATTLE OF LAKE REGILLUS

A Lay Sung at the Feast in Honor of Castor and Pollux.

I

Ho, trumpets, sound a war-note!
Ho, lictors, clear the way!
The Knights will ride, in all their pride,
Along the streets to-day.
To-day the doors and windows
Are hung with garlands all,
From Castor in the Forum,
To Mars without the wall.
Each Knight is robed in purple,
With olive each is crowned;

A gallant war-horse under each
Paws haughtily the ground.
While flows the Yellow River,
While stands the Sacred Hill,
The proud Ides of Quintilis
Shall have such honor still.
Gay are the Martian Kalends:
December's Nones are gay:
But the proud Ides, when the squadron rides,
Shall be Rome's whitest day.

II

Unto the Great Twin Brethren
We keep this solemn feast.
Swift, swift, the Great Twin Brethren
Came spurring from the east.
They came o'er wild Parthenius
Tossing in waves of pine,
O'er Cirrha's dome, o'er Adria's foam,
O'er purple Apennine,
From where with flutes and dances
Their ancient mansion rings,
In lordly Lacedaemon,
The city of two kings,
To where, by Lake Regillus,
Under the Porcian height,
All in the lands of Tusculum,
Was fought the glorious fight.

III

Now on the place of slaughter
Are cots and sheepfolds seen,

And rows of vines, and fields of wheat,
And apple-orchards green;
The swine crush the big acorns
That fall from Corne's oaks.
Upon the turf by the Fair Fount
The reaper's pottage smokes.
The fisher baits his angle;
The hunter twangs his bow;
Little they think on those strong limbs
That molder deep below.
Little they think how sternly
That day the trumpets pealed;
How in the slippery swamp of blood
Warrior and war-horse reeled;
How wolves came with fierce gallop,
And crows on eager wings,
To tear the flesh of captains,
And peck the eyes of kings;
How thick the dead lay scattered
Under the Porcian height;
How through the gates of Tusculum
Raved the wild stream of flight;
And how the Lake Regillus
Bubbled with crimson foam,
What time the Thirty Cities
Came forth to war with Rome.

IV

But, Roman, when thou standest
Upon that holy ground,
Look thou with heed on the dark rock
That girds the dark lake round.

So shalt thou see a hoof-mark
Stamped deep into the flint:
It was no hoof of mortal steed
That made so strange a dint:
There to the Great Twin Brethren
Vow thou thy vows, and pray
That they, in tempest and in fight,
Will keep thy head away.

V

Since last the Great Twin Brethren
Of mortal eyes were seen,
Have years gone by an hundred
And fourscore and thirteen.
That summer a Virginius
Was consul first in place:
The second was stout Aulus,
Of the Posthumian race.
The Herald of the Latines
From Gabii came in state:
The Herald of the Latines
Passed through Rome's Eastern Gate;
The Herald of the Latines
Did in our Forum stand;
And there he did his office,
A scepter in his hand.

VI

“Hear, Senators and people
Of the good town of Rome,
The Thirty Cities charge you
To bring the Tarquins home:

And if ye still be stubborn,
To work the Tarquins wrong,
The Thirty Cities warn you,
Look that your walls be strong."

VII

Then spake the Consul Aulus,
He spake a bitter jest:
"Once the jays sent a message
Unto the eagle's nest:—
Now yield thou up thine eyrie
Unto the carrion-kite,
Or come forth valiantly, and face
The jays in deadly fight.—
Forth looked in wrath the eagle;
And carrion-kite and jay,
Soon as they saw his beak and claw,
Fled screaming far away."

VIII

The Herald of the Latines
Hath hied him back in state:
The Fathers of the City
Are met in high debate.
Then spake the elder Consul,
An ancient man and wise:
"Now hearken, Conscript Fathers,
To that which I advise.
In seasons of great peril
'Tis good that one bear sway;
Then choose we a Dictator,
Whom all men shall obey.

Camerium knows how deeply
The sword of Aulus bites,
And all our city calls him
The man of seventy fights.
Then let him be Dictator
For six months and no more,
And have a Master of the Knights
And axes twenty-four."

IX

So Aulus was Dictator,
The man of seventy fights;
He made Aebutius Elva
His Master of the Knights.
On the third morn thereafter,
At dawning of the day,
Did Aulus and Aebutius
Set forth with their array.
Sempronius Atratinus
Was left in charge at home,
With boys, and with gray-headed men,
To keep the walls of Rome.
Hard by the Lake Regillus
Our camp was pitched at night:
Eastward a mile the Latines lay,
Under the Porcian height.
Far over hill and valley
Their mighty host was spread;
And with their thousand watch-fires
The midnight sky was red.

XIV

Now on each side the leaders
Give signal for the charge;
And on each side the footmen
Strode on with lance and targe;
And on each side the horsemen
Struck their spurs deep in gore,
And front to front the armies
Met with a mighty roar:
And under that great battle
The earth with blood was red;
And, like the Pomptine fog at morn,
The dust hung overhead;
And louder still and louder
Rose from the darkened field
The braying of the war-horns,
The clang of sword and shield,
The rush of squadrons sweeping
Like whirlwinds o'er the plain,
The shouting of the slaying,
And screeching of the slain.

XVII

But meanwhile in the center
Great deeds of arms were wrought;
There Aulus the Dictator
And there Valerius fought.
Aulus with his good broadsword
A bloody passage cleared
To where, amidst the thickest foes,
He saw the long white beard.

Flat lighted that good broadsword
Upon proud Tarquin's head.
He dropped the lance: he dropped the reins:
He fell as fall the dead.
Down Aulus springs to slay him,
With eyes like coals of fire;
But faster Titus hath sprung down,
And hath bestrode his sire.
Latian captains, Roman knights,
Fast down to earth they spring,
And hand to hand they fight on foot
Around the ancient king.
First Titus gave tall Cæso
A death-wound in the face;
Tall Cæso was the bravest man
Of the brave Fabian race:
Aulus slew Rex of Gabii,
The priest of Juno's shrine;
Valerius smote down Julius,
Of Rome's great Julian line;
Julius, who left his mansion,
High on the Velian hill,
And through all turns of weal and woe
Followed proud Tarquin still.
Now right across proud Tarquin
A corpse was Julius laid;
And Titus groaned with rage and grief,
And at Valerius made.
Valerius struck at Titus,
And lopped off half his crest;
But Titus stabbed Valerius
A span deep in the breast.

Like a mast snapped by the tempest,
Valerius reeled and fell.
Ah! woe is me for the good house
That loves the people well!
Then shouted loud the Latines;
And with one rush they bore
The struggling Romans backward
Three lances' length and more:
And up they took proud Tarquin,
And laid him on a shield,
And four strong yeomen bare him,
Still senseless, from the field.

XVIII

But fiercer grew the fighting
Around Valerius dead;
For Titus dragged him by the foot,
And Aulus by the head.
“ On, Latines, on! ” quoth Titus,
“ See how the rebels fly! ”
“ Romans, stand firm! ” quoth Aulus,
“ And win this fight, or die!
They must not give Valerius
To raven and to kite,
For aye Valerius loathed the wrong,
And aye upheld the right;
And for your wives and babies
In the front rank he fell.
Now play the men for the good house
That loves the people well! ”

XIX

Then tenfold round the body
The roar of battle rose,
Like the roar of a burning forest,
When a strong north wind blows.
Now backward, and now forward,
Rocked furiously the fray,
Till none could see Valerius,
And none wist where he lay.
For shivered arms and ensigns
Were heaped there in a mound,
And corpses stiff, and dying men
That writhed and gnawed the ground;
And wounded horses kicking,
And snorting purple foam:
Right well did such a couch befit
A Consular of Rome:

XX

But north looked the Dictator;
North looked he long and hard;
And spake to Caius Cossus,
The Captain of his Guard:
“ Caius, of all the Romans
Thou hast the keenest sight;
Say, what through yonder storm of dust
Comes from the Latian right? ”

XXI

Then answered Caius Cossus:
“ I see an evil sight;

The banner of proud Tusculum
Comes from the Latian right;
I see the pluméd horsemen;
And far before the rest
I see the dark-gray charger,
I see the purple vest;
I see the golden helmet
That shines far off like flame;
So ever rides Mamilius,
Prince of the Latian name."

XXII

"Now hearken, Caius Cossus:
Spring on thy horse's back;
Ride as the wolves of Apennine
Were all upon thy track;
Haste to our southward battle:
And never draw thy rein
Until thou find Herminius,
And bid him come amain."

XXIII

So Aulus spake, and turned him
Again to that fierce strife;
And Caius Cossus mounted,
And rode for death and life.
Loud clanged beneath his horse-hoofs
The helmets of the dead,
And many a curdling pool of blood
Splashed him from heel to head.
So came he far to southward,
Where fought the Roman host,

Against the banners of the marsh
And banners of the coast.
Like corn before the sickle
The stout Lavinians fell,
Beneath the edge of the true sword
That kept the bridge so well.

XXIV

“ Herminius! Aulus greets thee;
He bids thee come with speed,
To help our central battle,
For sore is there our need;
There wars the youngest Tarquin,
And there the Crest of Flame,
The Tusculan Mamilius,
Prince of the Latian name.
Valerius hath fallen fighting
In front of our array;
And Aulus of the seventy fields
Alone upholds the day.”

XXV

Herminius beat his bosom:
But never a word he spake.
He clasped his hand on Auster's mane:
He gave the reins a shake.
Away, away, went Auster,
Like an arrow from the bow:
Black Auster was the fleetest steed
From Aufidus to Po.

XXVI

Right glad were all the Romans
Who, in that hour of dread,
Against great odds bare up the war
Around Valerius dead,
When from the south the cheering
Rose with a mighty swell:
“ Herminius comes, Herminius,
Who kept the bridge so well! ”

XXVII

Mamilius spied Herminius,
And dashed across the way.
“ Herminius! I have sought thee
Through many a bloody day.
One of us two, Herminius,
Shall never more go home.
I will lay on for Tusculum,
And lay thou on for Rome! ”

XXVIII

All round them paused the battle,
While met in mortal fray
The Roman and the Tusculan,
The horses black and gray.
Herminius smote Mamilius
Through breast-plate and through breast;
And fast flowed out the purple blood
Over the purple vest.
Mamilius smote Herminius

Through head-piece and through head;
And side by side those chiefs of pride
Together fell down dead.
Down fell they dead together
In a great lake of gore:
And still stood all who saw them fall
While men might count a score.

XXIX

Fast, fast, with heels wild spurning,
The dark-gray charger fled:
He burst through ranks of fighting-men,
He sprang o'er heaps of dead.
His bridle far out-streaming,
His flanks all blood and foam,
He sought the southern mountains,
The mountains of his home:
The pass was steep and rugged,
The wolves they howled and whined;
But he ran like a whirlwind up the pass,
And he left the wolves behind.
Through many a startled hamlet
Thundered his flying feet;
He rushed through the gate of Tusculum,
He rushed up the long white street;
He rushed by tower and temple,
And paused not from his race
Till he stood before his master's door
In the stately market-place.
And straightway round him gathered
A pale and trembling crowd;

And when they knew him, cries of rage
 Brake forth, and wailing loud:
And women rent their tresses
 For their great prince's fall;
And old men girt on their old swords,
 And went to man the wall.

XXX

But, like a graven image,
 Black Auster kept his place,
And ever wistfully he looked
 Into his master's face.
The raven-mane that daily,
 With pats and fond caresses,
The young Herminia washed and combed,
 And twined in even tresses,
And decked with colored ribands
 From her own gay attire,
Hung sadly o'er her father's corpse
 In carnage and in mire.
Forth with a shout sprang Titus,
 And seized black Auster's rein.
Then Aulus sware a fearful oath,
 And ran at him amain.
"The furies of thy brother
 With me and mine abide,
If one of your accursed house
 Upon black Auster ride!"
As on an Alpine watch-tower
 From heaven comes down the flame,
Full on the neck of Titus
 The blade of Aulus came:

And out the red blood spouted,
In a wide arch and tall,
As spouts a fountain in the court
Of some rich Capuan's hall.
The knees of all the Latines
Were loosened with dismay,
When dead, on dead Herminius,
The bravest Tarquin lay.

XXXI

And Aulus the Dictator
Stroked Auster's raven mane,
With heed he looked unto the girths,
With heed unto the rein.
"Now bear me well, black Auster,
Into yon thick array;
And thou and I will have revenge
For thy good lord this day."

XXXII

So spake he; and was buckling
Tighter black Auster's band,
When he was aware of a princely pair
That rode at his right hand.
So like they were, no mortal
Might one from other know;
White as snow their armor was;
Their steeds were white as snow.
Never on earthly anvil
Did such rare armor gleam:
And never did such gallant steeds
Drink of an earthly stream.

XXXIII

And all who saw them trembled,
And pale grew every cheek;
And Aulus the Dictator
Scarce gathered voice to speak.
“ Say by what name men call you?
What city is your home?
And wherefore ride ye in such guise
Before the ranks of Rome? ”

XXXIV

“ By many names men call us;
In many lands we dwell:
Well Samothracia knows us;
Cyrene knows us well.
Our house in gay Tarentum
Is hung each morn with flowers;
High o’er the masts of Syracuse
Our marble portal towers;
But by the proud Eurotas
Is our dear native home;
And for the right we come to fight
Before the ranks of Rome.”

XXXV

So answered those strange horsemen,
And each couched low his spear;
And forthwith all the ranks of Rome
Were bold, and of good cheer:
And on the thirty armies
Came wonder and affright,

And Ardea wavered on the left,
And Cora on the right.
"Rome to the charge!" cried Aulus;
"The foe begins to yield!
Charge for the hearth of Vesta!
Charge for the Golden Shield!
Let no man stop to plunder,
But slay, and slay, and slay;
The gods who live forever
Are on our side to-day."

XXXVI

Then the fierce trumpet-flourish
From earth to heaven arose,
The kites know well the long stern swell
That bids the Romans close.
Then the good sword of Aulus
Was lifted up to slay:
Then, like a crag down Apennine,
Rushed Auster through the fray.
But under those strange horsemen
Still thicker lay the slain;
And after those strange horses
Black Auster toiled in vain.
Behind them Rome's long battle
Came rolling on the foe,
Ensigns dancing wild above,
Blades all in line below.
So comes the Po in flood-time
Upon the Celtic plain:
So comes the squall, blacker than night,
Upon the Adrian main.

Now by our sire Quirinus,
It was a goodly sight
To see the thirty standards
Swept down the tide of flight.
So flies the spray of Adria
When the black squall doth blow;
So corn-sheaves in the flood-time
Spin down the whirling Po.
False Sextus to the mountains
Turned first his horse's head;
And fast fled Ferentinum,
And fast Lanuvium fled.
The horsemen of Nomentum
Spurred hard out of the fray;
The footmen of Velitrae
Threw shield and spear away.
And underfoot was trampled,
Amidst the mud and gore,
The banner of proud Tusculum,
That never stooped before:
And down went Flavius Faustus,
Who led his stately ranks
From where the apple blossoms wave
On Anio's echoing banks,
And Tullus of Arpinum,
Chief of the Volscian aids,
And Metius with the long fair curls,
The love of Anxur's maids,
And the white head of Vulso,
The great Arician seer,
And Nepos of Laurentum,
The hunter of the deer;

And in the back false Sextus
Felt the good Roman steel,
And wriggling in the dust he died,
Like a worm beneath the wheel:
And fliers and pursuers
Were mingled in a mass;
And far away the battle
Went roaring through the pass.

XXXVII

Sempronius Atratinus
Sat in the Eastern Gate,
Beside him were three Fathers,
Each in his chair of state—
Fabius, whose nine stout grandsons
That day were in the field,
And Manlius, eldest of the Twelve
Who keep the Golden Shield;
And Sergius, the High Pontiff,
For wisdom far renowned;
In all Etruria's colleges
Was no such Pontiff found.
And all around the portal,
And high above the wall,
Stood a great throng of people,
But sad and silent all;
Young lads, and stooping elders
That might not bear the mail,
Matrons with lips that quivered,
And maids with faces pale.
Since the first gleam of daylight,
Sempronius had not ceased

To listen for the rushing
Of horse-hoofs from the east.
The mist of eve was rising,
The sun was hastening down,
When he was aware of a princely pair
Fast pricking towards the town.
So like they were, man never
Saw twins so like before;
Red with gore their armor was,
Their steeds were red with gore.

XXXVIII

“ Hail to the great Asylum!
Hail to the hill-tops seven!
Hail to the fire that burns for aye,
And the shield that fell from heaven!
This day, by Lake Regillus,
Under the Porcian height,
All in the lands of Tusculum
Was fought a glorious fight.
To-morrow your Dictator
Shall bring in triumph home
The spoils of thirty cities
To deck the shrines of Rome! ”

XXXIX

Then burst from that great concourse
A shout that shook the towers,
And some ran north, and some ran south,
Crying, “ The day is ours! ”
But on rode these strange horsemen,
With slow and lordly pace;

And none who saw their bearing
Durst ask their name or race.
On rode they to the Forum,
While laurel-boughs and flowers,
From house-tops and from windows,
Fell on their crests in showers.
When they drew nigh to Vesta,
They vaulted down amain,
And washed their horses in the well
That springs by Vesta's fane.
And straight again they mounted,
And rode to Vesta's door;
Then, like a blast, away they passed,
And no man saw them more.

XL

And all the people trembled,
And pale grew every cheek;
And Sergius the High Pontiff
Alone found voice to speak:
"The gods who live forever
Have fought for Rome to-day!
These be the Great Twin Brethren
To whom the Dorians pray.
Back comes the Chief in triumph,
Who, in the hour of fight,
Hath seen the Great Twin Brethren
In harness on his right.
Safe comes the ship to haven,
Through billows and through gales,
If once the Great Twin Brethren
Sit shining on the sails.

Wherefore they washed their horses
In Vesta's holy well,
Wherefore they rode to Vesta's door,
I know, but may not tell.
Here, hard by Vesta's Temple,
Build we a stately dome
Unto the Great Twin Brethren
Who fought so well for Rome.
And when the months returning
Bring back this day of fight,
The proud Ides of Quintilis,
Marked evermore with white,
Unto the Great Twin Brethren
Let all the people throng,
With chaplets and with offerings,
With music and with song;
And let the doors and windows
Be hung with garlands all,
And let the knights be summoned
To Mars without the wall:
Thence let them ride in purple
With joyous trumpet-sound,
Each mounted on his war-horse,
And each with olive crowned;
And pass in solemn order
Before the sacred dome,
Where dwell the Great Twin Brethren
Who fought so well for Rome."

—THOMAS BABINGTON MACAULAY.

THE TWO LIONS AND THE CRAB

LEO—LEO MINOR—CANCER, THE CRAB

Low in the east in February we have the Two Lions and the Crab following after the Twins. They are directly overhead in April, and are last seen in the west in July.

Cancer or The Crab

Praesepe



The Sickle

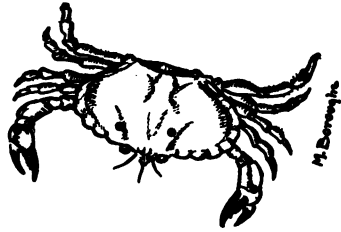
Regulus

Leo Minor—
The Little Lion

Leo—
The Lion

Denebola

Berenice's Hair



And watch the Manger like a little mist;
Far north, in Cancer's territory, it floats;
Its confines are two faintly glimmering stars,
One on the north, the other on the south.

THE TWO LIONS AND THE CRAB

THE constellation of Leo, the Great Lion, lies back of the bowl of the Big Dipper. It can easily be located by the sickle-shaped cluster of stars in the Lion's shoulder. The end star in the handle of the sickle is of the first magnitude, and received from Copernicus the name Regulus ("The Little King," from Latin *rex*), because of the ancient belief that it ruled the affairs of heaven. The English often call it the Royal Star, and the Persians called it one of the Four Royal Stars, or the Four Guardians of Heaven. The other guardians are Fomalhaut, Aldebaran, and Antares. The reason for calling these stars the Guardians is simple: each occupies a quarter of the sky by itself; and all but Fomalhaut lie very near the Ecliptic. See if you can find the Royal Four.

At the tip of the Lion's tail is Denebola, the second brightest star in the constellation. Both Regulus and Denebola are like Sirius in being younger than our sun.

Nearly all the ancient nations saw a lion in this constellation, and the Greeks thought it was the celebrated Nemaean lion slain by the hero Hercules, of whom they tell the story in this fashion. Hercules, the powerful, dwelt at the court of his cousin, King Eurystheus, but the King dreaded him and wished his destruction. He bade Hercules go slay the Nemaean lion and bring back its carcass. He thought Hercules could never escape alive, for this lion was the largest, strongest, and fiercest

ever heard of in the world. Hercules soon found the lion, and shot arrow after arrow at it, but they simply fell to the ground without being able to pierce its hide, and did not even annoy it. Finally one pricked sharply enough to rouse the lion's rage, and with a rush it made for Hercules. The hero had only just time enough to pull up a young oak tree by the roots to use for a club before the lion sprang at him. He wielded his club mightily, beating the lion backwards, and following it clear into its den. There he grappled with it, and, after a fearful wrestle, got his arms about its body and crushed it to death. He threw the corpse over his shoulders and held the paws around his neck, and thus he returned to the court, where Eurystheus was more terrified than before. The lion's skin was so tough that Hercules constantly wore it after that as a sort of armor.

The Lesser Lion lies between Leo and the Dipper. It is a small constellation; and is inconspicuous both to the naked eye and to the telescope, since it contains no bright stars; three are of the fourth magnitude, and six of the fifth. It has no myth associated with it, as it was invented in the seventeenth century by Helvetius to occupy an empty space among the constellations.

Between the Lion and the Twins is the famous Cancer, or Crab. It is a constellation without any bright stars (there are five of the fourth magnitude), and we can but wonder at its great antiquity. In its center, between two of the fourth magnitude stars, shines a silvery spot called Praesepe, or the Manger. Homer and Aratus sang of the Manger as a weather portent, and in the days of Galileo it became famous because it furnished Galileo one of his first assurances that there

are multitudes of stars not visible to the naked eye. He wrote: "Praesepe is not one star only, but a mass of more than forty small stars." This was a wonderful discovery in the days when nobody else had seen more stars than you or I can see unaided, and when it was generally believed that all the stars in existence were visible to the naked eye. Now anybody with a large opera or field glass can see all that Galileo saw, and be delighted with the sight—but not as Galileo was delighted, because he was the first man ever to see these wonders;

"Then felt I as some watcher of the skies
When a new planet swims into his ken."

Praesepe has another honor, also. It is said that the most ancient scientific observation of Jupiter known to us was made by Ptolemy, eighty-three years after the death of Alexander the Great, when Jupiter happened to pass near Praesepe and eclipsed the star now called Delta in the Crab. In English folklore Praesepe is called the Beehive, which it resembles more closely than a manger.

Cancer is also associated with the myth of Hercules, whose own constellation we shall study later on. Cancer represents the crab that Hera (or Juno) sent to bite the foot of Hercules when he was struggling with the Hydra in the Lernaean marshes. Hercules stepped on it and crushed it; and Juno was so grieved at its death that she persuaded Zeus to translate it to the sky as a constellation.

BERENICE'S HAIR

COMA BERENICES

Rising very shortly after the Lion is the constellation of Berenice's Hair. Its season lasts from February to July.

BERENICE'S HAIR

If you will pass a line from the star Benetnasch, on the tip of the Great Bear's tail, to Denebola, the star on the tip of the Lion's tail, it will pass through the glimmering little constellation of Berenice's Hair about two-thirds of the way from Benetnasch to Denebola. Berenice's Hair contains no bright stars. It has several of the fourth and fifth magnitudes, and many of the sixth magnitude that make it twinkle charmingly. An opera glass or a small field glass makes a very pretty sight of this host of tiny stars.

The name Berenice's Hair, or Coma Berenices, has been derived from an Egyptian fable. Ptolemy, a king of Egypt, was away from home on a long war. Berenice, his bride, grieved greatly over his absence and the dangers he must encounter. She finally vowed to the gods that she would consecrate her wonderful hair to Venus if they would bring her husband safely home. Ptolemy returned, and Berenice fulfilled her promise. But Venus was not willing that such a treasure should remain even in her temple; so she sent for it and had it placed as a constellation among the stars. There is a story that the locks of Berenice did not consider it as great an honor to be in the sky as on the head of the beautiful Queen, and often lamented that they could not return to her.

BERENICE'S HAIR

THE sage that did with curious cunning trace
The lights that gleam through all the vast of space,
Numbered the constellations o'er, and knew
The rising of the stars, their setting too;
What veils the sun's splendence in eclipse,
And why at stated times each planet dips
Beyond our ken; how love's delicious power
Drew Thivia down from her aerial bower
To Latmos' cave;—he, Conon, sage divine,
Descried me, where afar in heaven I shine:
I 'mongst the stars myself resplendent now,
I who once curled on Berenice's brow,
The tress which she, uplifting her fair arms,
To many a god devoted, so from harms
They might protect her new-found royal mate.

.

How wert thou racked with terror and with pain,
'Til reason tottered in thy tortured brain!
Yet from thy tenderest maiden years had I
Thy spirit known magnanimous and high.
Didst thou that deed of noble note forget,
Which won for thee thy royal lord, and yet
Shines on the roll of fame pre-eminent?
But, oh thy grief when forth thy husband went!
What words of anguish! mighty Jove, what sighs!
What tears by fingers wan dashed from thine eyes!

.

Then, then it was for thy dear spouse that thou
Thy crisped hairs to all the gods didst vow,

With blood of bulls, to speed him home, and bring
All Asia vassal bound to Egypt's king.

Thy prayers were heard; and 'mongst celestials now
With luster new I pay thy pristine vow;
And yet reluctantly, oh queen most fair,
I parted from thee! by thyself, I swear,
And by thy head! and dire shall be his doom,
Who may to slight that awful oath presume!
But what can stand against the might of steel?
'Twas that which made the proudest mountain reel,
Of all by Thia's radiant sun surveyed,
What time the Mede a new Aegean made,
And hosts barbaric steered their galleys tall
Through rifted Athos' adamantine wall.
When things like these the power of steel confess,
What help or refuge for a woman's tress?
Oh, Jove! be all the Chalyb race accurst—
All, and whoe'er through earth's recesses first
Tracked out the veinèd ore, and in the fire
First shaped and tempered it to uses dire!

Whilst yet my sister tresses, parted late
From me they loved, were mourning o'er my fate,
On wingèd steed, by beating pinions driven,
Swept Ethiop Memnon's brother down from heaven,
And bore me from Arsinoe's shrine away,
Up through the regions of eternal day.
There did he lay me on chaste Venus' breast;
For she it was had sped him on his quest,
That Ariadne's crown should not alone
Gleam in the forehead of the starry zone,
But we, the golden spoils that decked her shrine,
Should there as well with equal radiance shine.

Still with the tears of my loved mistress wet,
Was I amidst the stars primeval set:
Hard by the Virgin's light, and Lions wild,
And to Callisto near, Lycaon's child,
I wheel into the west, and lead the way
Where slow Boötes, with a coy delay,
Beneath the mighty ocean dips his light.
But though the footsteps of the gods by night
Trample me down, yet am I with the dawn
Back to the breast of fair-haired Tethys drawn.
Yet be not wroth, Rhamnusian maid, to hear
The truth I scorn to hide in vulgar fear;
Though on the avowal all the stars cry shame,
The yearning which I feel I must proclaim.
My state so glads me not, but I deplore
I ne'er may grace my mistress' forehead more,
With whom consorting in her virgin bloom,
I bathed in sweets, and quaffed the rich perfume.

.

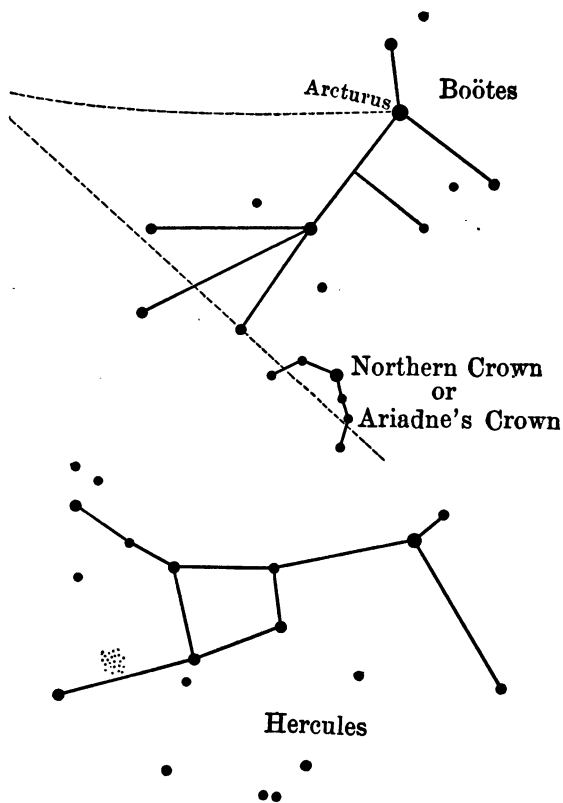
But oh, my queen! when lifting up thy gaze
Here to the stars, with torches' festal blaze
Thou dost propitiate Venus, let not me
Be all forgotten or unseen by thee.
Nay, rather unto me, who once was all
Thine own, with bounteous offerings duly call.
Once all thine own? Ay, still thine, only thine!
Why am I doomed among the stars to shine?
Oh, on the forehead of my queen to play
Once more! Grant this, and then Aquarius may
Next to Orion blaze, and all the world
Of starry orbs be into chaos whirled!

—CATULLUS, translated by Theodore Martin.

BOÖTES—ARIADNE—HERCULES

From April till early October, the constellations of Boötes and Hercules, with the Northern Crown—or Ariadne's Crown—lying between them, can be seen crossing the sky, following close after the Lions. They are nearly overhead in early July.

● Cor Caroli





. . . the immortals divine
Loved well that maid. In the midst of the firmament is set
her sign,
A crown of stars, which they name Ariadne's diadem,
All night circling amidst the signs that the heavens begem.

BOÖTES, VIRGO, AND HERCULES

THE name of the constellation Boötes is interesting because of its great age, coming down to us from deep antiquity. It occurs in a line in Homer's *Odyssey*, sung probably a thousand years before Christ:

"So he sat and cunningly guided the craft with the helm, nor did sleep fall upon his eyelids as he viewed the Pleiades and Boötes, that setteth late, and the Bear, which they likewise call the Wain, which turneth ever in one place and alone hath no part in the baths of Ocean. This star, Calypso, the fair goddess bade him keep ever on the left as he traversed the deep."—*Odyssey*, Book V.

Boötes has been represented as a plowman and as a herdsman, but is usually pictured as a tall man holding in leash two dogs, which are tugging away, trying to reach the Great Bear, and driving it round and round the pole. The dogs, known as the Hunting Dogs, have so few stars in them that they are not always shown on the maps as a constellation. Their brightest star, named Cor Caroli, is a beautiful star of the third magnitude, and can be found just back of the handle of the Big Dipper. Its name means "Charles's Heart," and was given it by the astronomer Halley because it is said to have shone out with unusual brilliancy at the time of the coronation of Charles II.

"That star that at your birth shone out so bright,
It stain'd the duller sun's meridian light,

Did once again its potent fires renew,
Guiding our eyes to find and worship you."

—DRYDEN: *Astraea Redux*.

The Hunting Dogs, or Canes Venatici, were invented by Helvetius in the seventeenth century; consequently they possess no mythology, even though they are associated with English history. A line curving downward from the end star in the handle of the Big Dipper will reach the wonder, Arcturus, a star in Boötes, the one first-magnitude star of the constellation, and the rival of Vega and Capella in brightness. These three stars are of almost exactly the same magnitude, all being a very little below the standard zero magnitude. Arcturus is classed in color with the red stars, and when near the horizon it flames splendidly, but when high in the heavens its color seems to fade. It is a great sun, exceeding ours in intrinsic brilliancy at least one hundred times, and showing by its spectrum that it is older than our sun. Arcturus is one of the "runaway stars," and is moving so rapidly—from two hundred to three hundred miles per second!—that since the days of Ptolemy it has seemed to move the distance of twice the disk of the moon.

South of Boötes is the large constellation which has borne the name of the "Virgin" (*Virgo* in Latin) among people in all parts of the earth; in China, for example, it is the Frigid Maiden. In pictures the Virgin is usually drawn with a head of wheat in her left hand. In the constellation the wheat is represented by Spica—the name signifying a "wheat ear"—the only first-magnitude star of the group. Four bright stars, Spica in Virgo, Denebola in the Lion's tail, Cor

Caroli in the Hunting Dogs, and Arcturus in Boötes, form a geometrical figure called the "Diamond of Virgo." Spica, like Sirius, Rigel, and Vega, belongs to the younger order of suns, and is also of enormous size like them.

Between Boötes and Lyra, and about equally as far as they are from the Pole, is a large constellation with no striking configurations and no first-magnitude stars. Its Beta is of the second magnitude, and there are several stars of the third. In spite of all this, however, the constellation has attracted attention; many people in many lands have had myths and legends about it, and have used many names for it. We now call it Hercules, after the hero of whom the ancient Greeks tell many marvelous tales. And they are extremely interesting tales, too; I have already related one, and I wish I might tell you many, but only enough space is left for me to indicate them briefly. You should by all means try to learn more of them for yourself.

Hercules was the great-grandson of Perseus. The disasters of his life were brought upon him through the dislike of Juno, who became jealous of his mother. When he was a babe in the cradle, she sent two serpents to kill him, but he strangled both of them. Twice Juno sent fits of insanity upon him; in the first he killed his own three children, and in the second he slew his friend Iphitus. These fearful crimes had to be expiated. For the first he became the servant of his cowardly cousin Eurystheus, and by him was made to perform the famous "Twelve Labors," some of which were slaying the Nemean lion, killing the Lernaean hydra, cleansing the Augean stables, fetching the girdle of the Queen of the Amazons, stealing the apples of the

Hesperides, and seizing and bringing the dog Cerberus from Hades to the upper world. For his second crime he had to become slave to the Queen of the Lydians, who disgraced him by giving him a distaff and setting him to spin among her maidens for three years. His physical strength was most extraordinary. Once he supported on his own shoulders the whole dome of heaven to enable Atlas to get away to wade through the ocean to the Garden of the Hesperides for him. His kindness of heart was still greater. In ignorance he once made an unseemly noise in the house of Admetus just as Alcestis, the wife of Admetus, was being buried; when informed of the truth, he was so sorry that he atoned for his fault by leaping into the open grave and following her spirit to the lower regions, where he compelled Pluto to restore Alcestis alive to her husband. But greatest of all was his pity and his sense of justice. Led by a voice of agony, he climbed the steepest, most rugged heights of the Caucasus mountains, to the rock where Prometheus was bound with chains to a precipice. Hercules slew the vulture of Remorse, that ate ever at the heart of the giant; and struck the icy chains off the wrists and ankles of Prometheus (whose name means "Foresight"), the kindest friend mankind had ever had. When the time came to die, Hercules heaped up a huge pile of wood, set fire to it, and placed himself on its top; but just as the flames were about to reach the hero's tortured body, a cloud came down from the sky and bore him off to heaven.

BOÖTES AND VIRGO

HARD on the traces of the greater Bear
Presses Boötes in his swift career.
'Mong many gems, more brilliant than the rest,
Arcturus glows upon his belted waist.
Through the long day he drives the Arctic Wain,
And sinks reluctant in the western main.

Rising beneath Boötes' feet, admire
That beauteous form in maidenly attire.
In her left hand a golden spike she bears:
Glitter with sparkling gems her yellow hairs.
Art thou, fair Virgin, daughter of that fam'd
Immortal sage of old, *Astræus* nam'd,
With skilful hand who mapp'd the starry sky,
Plumbing its dark abyss with philosophic eye?
Or art thou, Goddess, she of heavenly birth,
Who condescended once to dwell on earth,
Astræa call'd, in fabled days of old—
Alas! forever gone—the Poet's age of gold?
Then Justice rul'd supreme, man's only guide,—
No fraud—no violence—no pride.
No sailor ventur'd then to distant clime,
And brought back foreign wealth and foreign crime.
All tended then the flock, or tilled the soil,
And milk and fruit repaid their easy toil;
All happy—equal, as the poets sing;
No fierce seditious mob—no tyrant king,—
But soon these days of innocence were gone:
In his sire's place arose a viler son
Of silver race. Then to the mountain's glen
Fair Justice fled. Yet still at times were seen
Her angel figure and her godlike mien.

But when she view'd the crowded city's throng—
"The proud man's contumely, the poor man's
wrong"—

Vex'd was her righteous soul. "Mortals, farewell,
Farewell," she said, "no more with man I dwell.
Ye of your sires a vile degenerate race,
Your offspring you, their fathers, will disgrace.
War soon will desolate these fruitful lands,
A brother's blood will stain a brother's hands.
Rising to view I see a ghostly train—
Revenge, Oppression, Woe, Despair, and Pain."
She said; and hastening to the mountain's height
Fled far away from mortal's longing sight.
These men soon pass'd away, and in their place
Far viler sons arose, the brazen race;
They first the stubborn ore obedient made,
And forg'd—unhallow'd skill—the murderous blade.
The patient ox, long wont to till the soil,
To tread the corn, and share his master's toil,
Dragg'd from his stall—poor harmless, slaughter'd
beast—

Gave to his cruel lord a bloody feast.
Justice was shock'd, the bloodstain'd earth she flies;
Jove bade her welcome to her native skies;
And near Boötes take her honor'd place,
Where men might still adore her angel face.
Sparkle her golden wings with crystal light;
One gem they bear superlatively bright:
It rolls neath Leo's tail, and may compare
With the fam'd stars that deck the greater Bear.
One gem upon her snow-white shoulder shines:
One clasps the silken girdle of her loins:

One decks her bending knee; and in her hand
Glitters her golden spike like fiery brand.
Many less brilliant stars, by name unknown,
Spangle her vestments, and her forehead crown.

—ARATUS, translated by John Lamb.

THE THREE GOLDEN APPLES

WHEN the old fellow heard who it was that had caught him, he saw with half an eye that it would be necessary to tell him everything that he wanted to know. The Old One was an inhabitant of the sea, and roamed about everywhere, like other seafaring people. Of course, he had often heard of the fame of Hercules, and of the wonderful things that he was constantly performing, in various parts of the earth, and how determined he always was to accomplish whatever he undertook. He therefore made no more attempts to escape, but told the hero how to find the garden of the Hesperides, and likewise warned him of many difficulties which must be overcome before he could arrive thither.

“You must go on, thus and thus,” said the Old Man of the Sea, after taking the points of the compass, “till you come in sight of a very tall giant who holds the sky on his shoulders. And the giant, if he happens to be in the humor, will tell you exactly where the garden of the Hesperides lies.”

“And if the giant happens not to be in the humor,” remarked Hercules, balancing his club on the tip of his finger, “perhaps I shall find means to persuade him.”

Thanking the Old Man of the Sea, and begging his pardon for having squeezed him so roughly, the hero

resumed his journey. He met with a great many strange adventures, which would be well worth your hearing, if I had leisure to narrate them as minutely as they deserve.

It was in this journey, if I mistake not, that he encountered a prodigious giant who was so wonderfully contrived by nature that every time he touched the earth he became ten times as strong as ever he had been before. His name was Antæus. You may see plainly enough that it was a very difficult business to fight with such a fellow, for as often as he got a knockdown blow, up he started again, stronger, fiercer, and abler to use his weapons than if his enemy had let him alone. Thus, the harder Hercules pounded the giant with his club, the further he seemed from winning the victory. I have sometimes argued with such people, but never fought with one. The only way in which Hercules found it possible to finish the battle was by lifting Antæus off his feet into the air, and squeezing and squeezing and squeezing him until finally the strength was quite squeezed out of his enormous body.

When this affair was finished, Hercules continued his travels and went to the land of Egypt, where he was taken prisoner, and would have been put to death if he had not slain the king of the country and made his escape. Passing through the deserts of Africa and going as fast as he could, he arrived at last on the shore of the great ocean. And here, unless he could walk on the crests of the billows, it seemed as if his journey must needs be at an end.

Nothing was before him save the foaming, dashing, measureless ocean. But suddenly, as he looked toward the horizon, he saw something, a great way off, which

he had not seen the moment before. It gleamed very brightly, almost as you may have beheld the round, golden disk of the sun when it rises or sets over the edge of the world. It evidently drew nearer, for at every instant this wonderful object became larger and more lustrous. At length it had come so nigh that Hercules discovered it to be an immense cup or bowl made either of gold or burnished brass. How it had got afloat upon the sea is more than I can tell you. There it was, at all events, rolling on the tumultuous billows, which tossed it up and down and heaved their foamy tops against its sides, but without ever throwing their spray over the brim.

"I have seen many giants in my time," thought Hercules, "but never one that would need to drink his wine out of a cup like this."

And, true enough, what a cup it must have been! It was as large—as large—but, in short, I am afraid to say how immeasurably large it was. To speak within bounds, it was ten times larger than a great mill-wheel, and, all of metal as it was, it floated over the heaving surges more lightly than an acorn-cup down the brook. The waves tumbled it onward until it grazed against the shore within a short distance of the spot where Hercules was standing.

As soon as this happened, he knew what was to be done, for he had not gone through so many remarkable adventures without learning pretty well how to conduct himself whenever anything came to pass a little out of the common rule. It was just as clear as daylight that this marvelous cup had been set adrift by some unseen power and guided hitherward in order to carry Hercules across the sea on his way to the garden of the Hes-

perides. Accordingly, without a moment's delay he clambered over the brim and slid down on the inside, where, spreading out his lion's skin, he proceeded to take a little repose. He had scarcely rested until now since he bade farewell to the damsels on the margin of the river. The waves dashed with a pleasant and ringing sound against the circumference of the hollow cup; it rocked lightly to and fro, and the motion was so soothing that it speedily rocked Hercules into an agreeable slumber.

His nap had probably lasted a good while when the cup chanced to graze against a rock, and in consequence immediately resounded and reverberated through its golden or brazen substance a hundred times as loudly as ever you heard a church bell. The noise awoke Hercules, who instantly started up and gazed around him, wondering whereabouts he was. He was not long in discovering that the cup had floated across a great part of the sea, and was approaching the shore of what seemed to be an island. And on that island what do you think he saw?

No, you will never guess it—not if you were to try fifty thousand times! It positively appears to me that this was the most marvelous spectacle that had ever been seen by Hercules in the whole course of his wonderful travels and adventures. It was a greater marvel than the hydra with nine heads, which kept growing twice as fast as they were cut off; greater than the six-legged man-monster; greater than Antæus; greater than anything that was ever beheld by anybody before or since the days of Hercules, or than anything that remains to be beheld by travelers in all time to come. It was a giant!

But such an intolerably big giant! A giant as tall as a mountain; so vast a giant that the clouds rested about his midst like a girdle, and hung like a hoary beard from his chin, and flitted before his huge eyes so that he could neither see Hercules nor the golden cup in which he was voyaging. And, most wonderful of all, the giant held up his great hands and appeared to support the sky, which, so far as Hercules could discern through the clouds, was resting upon his head! This does really seem almost too much to believe.

Meanwhile the bright cup continued to float onward, and finally touched the strand. Just then a breeze wafted away the clouds from before the giant's visage, and Hercules beheld it with all its enormous features—eyes each of them as big as yonder lake, a nose a mile long, and a mouth of the same width. It was a countenance terrible from its enormity of size, but disconsolate and weary, even as you may see the faces of many people nowadays who are compelled to sustain burdens above their strength. What the sky was to the giant, such are the cares of earth to those who let themselves be weighed down by them. And whenever men undertake what is beyond the just measure of their abilities they encounter precisely such a doom as had befallen this poor giant.

Poor fellow! He had evidently stood there a long while. An ancient forest had been growing and decaying around his feet, and oak trees of six or seven centuries old had sprung from the acorns and forced themselves between his toes.

The giant now looked down from the far height of his great eyes, and perceiving Hercules, roared out, in a

voice that resembled thunder proceeding out of the cloud that had just flitted away from his face:

“ Who are you, down at my feet there? And whence do you come in that little cup? ”

“ I am Hercules! ” thundered back the hero, in a voice pretty nearly or quite as loud as the giant’s own. “ And I am seeking for the garden of the Hesperides! ”

“ Ho! ho! ho! ” roared the giant, in a fit of immense laughter. “ That is a wise adventure, truly! ”

“ And why not? ” cried Hercules, getting a little angry at the giant’s mirth. “ Do you think I am afraid of the dragon with a hundred heads? ”

Just at this time, while they were talking together, some black clouds gathered about the giant’s middle and burst into a tremendous storm of thunder and lightning, causing such a pother that Hercules found it impossible to distinguish a word. Only the giant’s immeasurable legs were to be seen, standing up into the obscurity of the tempest, and now and then a momentary glimpse of his whole figure mantled in a volume of mist. He seemed to be speaking most of the time, but his big, deep, rough voice chimed in with the reverberations of the thunder-claps and rolled away over the hills like them. Thus by talking out of season the foolish giant expended an incalculable quantity of breath to no purpose, for the thunder spoke quite as intelligibly as he.

At last the storm swept over as suddenly as it had come. And there again was the clear sky, and the weary giant holding it up, and the pleasant sunshine beaming over his vast height and illuminating it against the background of the sullen thunder-clouds. So far

above the shower had been his head that not a hair of it was moistened by the raindrops.

When the giant could see Hercules still standing on the seashore, he roared out to him anew:

“ I am Atlas, the mightiest giant in the world! And I hold the sky upon my head! ”

“ So I see,” answered Hercules. “ But can you show me the way to the garden of the Hesperides? ”

“ What do you want there? ” asked the giant.

“ I want three of the golden apples,” shouted Hercules, “ for my cousin, the king.”

“ There is nobody but myself,” quoth the giant, “ that can go to the garden of the Hesperides and gather the golden apples. If it were not for this little business of holding up the sky, I would make half a dozen steps across the sea and get them for you.”

“ You are very kind,” replied Hercules. “ And cannot you rest the sky upon a mountain? ”

“ None of them are quite high enough,” said Atlas, shaking his head. “ But if you were to take your stand on the summit of that nearest one, your head would be pretty nearly on a level with mine. You seem to be a fellow of some strength. What if you should take my burden on your shoulders while I do your errand for you? ”

Hercules, as you must be careful to remember, was a remarkably strong man; and, though it certainly requires a great deal of muscular power to uphold the sky, yet, if any mortal could be supposed capable of such an exploit, he was the one. Nevertheless, it seemed so difficult an undertaking that for the first time in his life he hesitated.

“ Is the sky very heavy? ” he inquired.

"Why, not particularly so at first," answered the giant, shrugging his shoulders, "but it gets to be a little burdensome after a thousand years."

"And how long a time," asked the hero, "will it take you to get the golden apples?"

"Oh, that will be done in a few moments," cried Atlas. "I shall take ten or fifteen miles at a stride, and be at the garden and back again before your shoulders begin to ache."

"Well, then," answered Hercules, "I will climb the mountain behind you there and relieve you of your burden."

The truth is, Hercules had a kind heart of his own, and considered that he should be doing the giant a favor by allowing him this opportunity for a ramble. And, besides, he thought that it would be still more for his own glory if he could boast of upholding the sky than merely to do so ordinary a thing as to conquer a dragon with a hundred heads. Accordingly, without more words, the sky was shifted from the shoulders of Atlas and placed upon those of Hercules.

When this was safely accomplished, the first thing that the giant did was to stretch himself; and you may imagine what a prodigious spectacle he was then. Next, he slowly lifted one of his feet out of the forest that had grown up around it, then the other. Then all at once he began to caper and leap and dance for joy at his freedom, flinging himself nobody knows how high into the air, and floundering down again with a shock that made the earth tremble. Then he laughed—ho! ho! ho!—with a thunderous roar that was echoed from the mountains far and near, as if they and the giant had been so many rejoicing brothers. When his joy had a

little subsided he stepped into the sea—ten miles at the first stride, which brought him midleg deep; and ten miles at the second, when the water came just above his knees; and ten miles more at the third, by which he was immersed nearly to his waist. This was the greatest depth of the sea.

Hercules watched the giant as he still went onward, for it was really a wonderful sight, this immense human form more than thirty miles off, half-hidden in the ocean, but with his upper half as tall and misty and blue as a distant mountain. At last the gigantic shape faded entirely out of view. And now Hercules began to consider what he should do in case Atlas should be drowned in the sea, or if he were to be stung to death by the dragon with the hundred heads which guarded the golden apples of the Hesperides. If any such misfortune were to happen, how could he ever get rid of the sky? And, by the by, its weight began already to be a little irksome to his head and shoulders.

“I really pity the poor giant,” thought Hercules. “If it wearies me so much in ten minutes, how must it have wearied him in a thousand years!”

Oh, my sweet little people, you have no idea what a weight there was in that same blue sky which looks so soft and aerial above our heads! And there, too, was the bluster of the wind, and the chill and watery clouds, and the blazing sun, all taking their turns to make Hercules uncomfortable. He began to be afraid that the giant would never come back. He gazed wistfully at the world beneath him and acknowledged to himself that it was a far happier kind of life to be a shepherd at the foot of a mountain than to stand on its dizzy summit and bear up the firmament with his might and

main. For, of course, as you will easily understand, Hercules had an immense responsibility on his mind, as well as a weight on his head and shoulders. Why, if he did not stand perfectly still and keep the sky immovable, the sun would perhaps be put ajar! Or, after nightfall, a great many of the stars might be loosened from their places and shower down like fiery rain upon the people's heads! And how ashamed would the hero be if, owing to his unsteadiness beneath its weight, the sky should crack and show a great fissure quite across it!

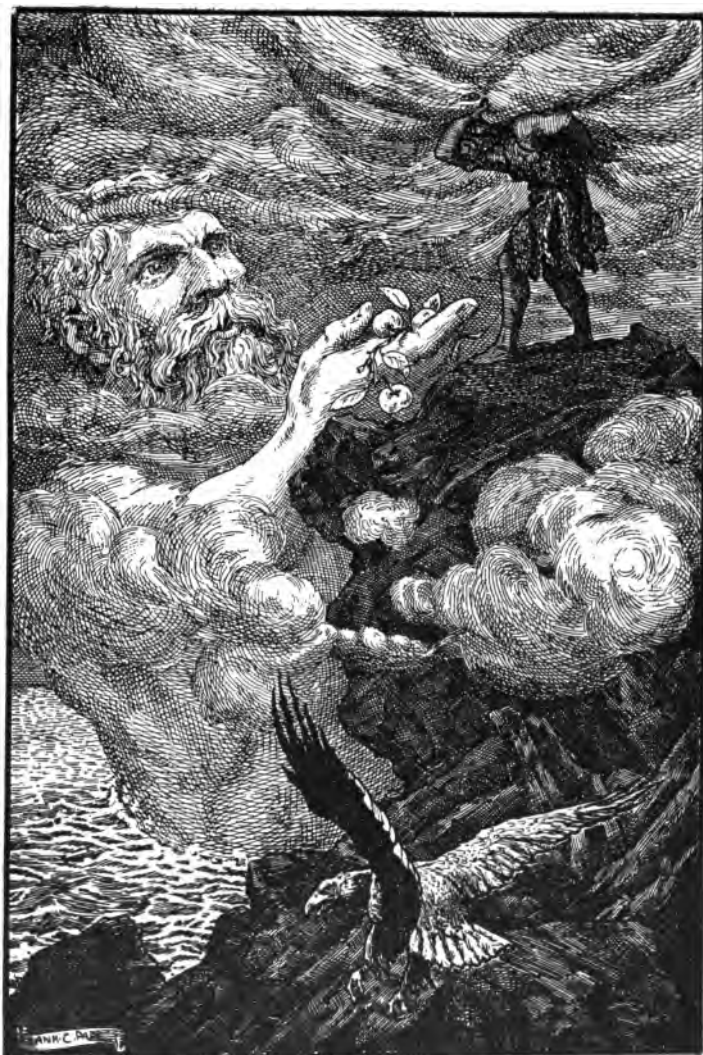
I know not how long it was before, to his unspeakable joy, he beheld the huge shape of the giant, like a cloud, on the far-off edge of the sea. At his nearer approach Atlas held up his hand, in which Hercules could perceive three magnificent golden apples as big as pumpkins, all hanging from one branch.

"I am glad to see you again," shouted Hercules when the giant was within hearing. "So you have got the golden apples?"

"Certainly, certainly," answered Atlas; "and very fair apples they are. I took the finest that grew on the tree, I assure you. Ah, it is a beautiful spot, that garden of the Hesperides! Yes, and the dragon with a hundred heads is a sight worth any man's seeing. After all, you had better have gone for the apples yourself."

"No matter," replied Hercules. "You have had a pleasant ramble and have done the business as well as I could. I heartily thank you for your trouble. And now, as I have a long way to go and am rather in haste, and as the king my cousin is anxious to receive the golden apples, will you be kind enough to take the sky off my shoulders again?"

"Why, as to that," said the giant, chucking the



HERCULES AND THE GOLDEN APPLES •

(Illustration by Frank C. Pape from Storr's "Half a Hundred Hero Tales")

golden apples into the air twenty miles high or thereabouts, and catching them as they came down—"as to that, my good friend, I consider you a little unreasonable. Cannot I carry the golden apples to the king your cousin much quicker than you could? As his majesty is in such a hurry to get them, I promise you to take my longest strides. And, besides, I have no fancy for burdening myself with the sky just now."

Here Hercules grew impatient and gave a great shrug of his shoulders. It being now twilight, you might have seen two or three stars tumble out of their places. Everybody on earth looked upward in affright, thinking that the sky might be going to fall next.

"Oh, that will never do!" cried Giant Atlas with a great roar of laughter. "I have not let fall so many stars within the last five centuries. By the time you have stood there as long as I did you will begin to learn patience."

"What!" shouted Hercules, very wrathfully, "do you intend to make me bear this burden forever?"

"We will see about that one of these days," answered the giant. "At all events, you ought not to complain if you have to bear it the next hundred years, or perhaps the next thousand. I bore it a good while longer, in spite of the backache. Well, then, after a thousand years, if I happen to feel in the mood, we may possibly shift about again. You are certainly a very strong man and can never have a better opportunity to prove it. Posterity will talk of you, I warrant it."

"Pish! a fig for its talk!" cried Hercules, with another hitch of his shoulders. "Just take the sky upon your head one instant, will you? I want to make a cushion of my lion's skin for the weight to rest upon."

It really chafes me and will cause unnecessary inconvenience in so many centuries as I am to stand here."

"That's no more than fair, and I'll do it," quoth the giant; for he had no unkind feeling toward Hercules, and was merely acting with a too selfish consideration of his own ease. "For just five minutes, then, I'll take back the sky. Only for five minutes, recollect. I have no idea of spending another thousand years as I spent the last. Variety is the spice of life, say I."

Ah, the thick-witted old rogue of a giant! He threw down the golden apples and received back the sky from the head and shoulders of Hercules upon his own, where it rightly belonged. And Hercules picked up the three golden apples that were as big or bigger than pumpkins, and straightway set out on his journey homeward without paying the slightest heed to the thundering tones of the giant, who bellowed after him to come back. Another forest sprang up around his feet and grew ancient there, and again might be seen oak trees of six or seven centuries old that had waxed thus aged betwixt his enormous toes.

And there stands the giant to this day; or, at any rate, there stands a mountain as tall as he and which bears his name; and when the thunder rumbles about its summit we may imagine it to be the voice of Giant Atlas bellowing after Hercules.

—NATHANIEL HAWTHORNE.

ARIADNE'S CROWN

Ariadne's Crown—also called the Northern Crown or Corona Borealis—is a striking little group of stars in the form of a crescent, lying between Boötes and Hercules. Alphecca, a star of the second magnitude, and the brightest in the constellation, shines in the front center of the crown, as the most precious star in the diadem. The Greeks tell us that the God Bacchus loved the beautiful Ariadne and married her. He gave her a crown of seven stars, and after her death the crown was placed in the sky to shine in her honor.

THE CHAMPION OF ATHENS

AETHRA, a daughter of the King of Troezene, was the wife of a foreign prince, and the mother of an only child, a boy, whom they named Theseus. While Theseus was still an infant, his father said one day to Aethra—

“ I am obliged to set off on a long and distant journey, through countries infested by wild beasts and robbers. If I should never return, take care of our child, bring him up like a king’s son, and send him to the city of Athens as soon as he grows strong enough to lift that stone.”

Aethra promised, and her husband left Troezene, never to return.

Having given up all hope of seeing her husband again, Aethra devoted herself to obeying his last commands. She gave Theseus the education of a prince; and every day, from the time he left her arms, she made him try to lift the stone. The child grew up to be the handsomest, strongest, and bravest youth in all the land, so that he had not a rival of his own age in all manly sports and feats of arms. But he could no more move the stone than he could fly.

At last, however, the moment came when the stone gave way a little. The next day he raised it a trifle further, and so on until he lifted it bodily from the ground, and rolled it away. Underneath it he found a

splendid sword, with a curiously carved hilt, unlike any he had ever seen.

The time had, therefore, come for him to set out for Athens, according to his father's commands. His mother implored him to go by sea, and not by those perilous paths by which her husband had never returned. But Theseus was only tempted by the dangers; and so, taking the sword with him, he set out for Athens overland.

After a long journey through a wild and difficult country, he reached a village, where he sought for supper and a night's lodging. But the place seemed deserted, and it was only after a long search that he discovered an old shepherd, of whom he asked where a traveler might find food and shelter.

"Alas!" answered the shepherd, "there is not a scrap of food left in the place, not a house left un-plundered. For Sciron has been here."

"And who is Sciron?" asked Theseus.

"Ah, you must be a stranger, indeed! Sciron is the chief of all the robbers. Do you see yonder castle among the mountains? That is where he lives, and thence he issues forth, when he wants food for his gluttony, to plunder and lay waste all the country round. And he is as cruel and savage as he is greedy. Not content with carrying off our cattle and our stores of corn and wine, he seizes men and women, and makes them wait upon him while he feasts; and when the feast is over, he amuses himself by throwing them from a high rock into the sea."

"Thank you," said Theseus. "Then I will sup with Sciron." And off he started for the robber's castle, leaving the amazed shepherd to think him a madman.

It was a long climb to the castle, which stood on the peak of a high cliff looking down into the sea. Theseus knocked upon the gate with the hilt of his sword, and, when it was opened by a ferocious-looking brigand, announced himself as a stranger who requested hospitality.

"You've come to the right place for that!" said the brigand grimly. "Come with me."

Theseus followed him into the hall, where broth was being brewed in caldrons, and a fat ox was being roasted whole. The robbers were all about,—some quarreling over their plunder, some sprawling about the floor. In the midst of all the steam and din sat the chief, a huge and cruel-looking brute, who Theseus did not need to be told was Sciron.

"So you want hospitality, do you?" asked Sciron. "Very well, as you're a traveler, and don't know the ways of the castle, you shall be let off easily. Of course, you'll have to be thrown from the cliff after supper—that's the rule. But instead of being tortured, you shall only wash my feet for me and wait on me at table. You look as if you understood washing and how things ought to be served. Now, then, get some hot water and begin," he said, thrusting out a pair of feet which looked as if they had not been touched by water for years.

A grinning robber brought a bowl of hot water. Theseus took it and threw it in the face of Sciron.

"That wants washing, too," said he.

Sciron rushed at him; but Theseus received him at the point of his sword, and the two fought furiously, while the robbers looked on, enjoying the game. Sciron was twice the size and weight of Theseus; but Theseus was

the best swordsman in all Greece, and presently had him down.

"There," said he, pricking Sciron's throat with his sword, "you have had a lesson in manners. You shall wash my feet and wait on me before you go over the cliff after your victims. For I am not going away to leave a brigand like you alive behind me!"

Sciron, like all such bullies, was a coward at heart, and his own men had no longer any respect for him now that he had been worsted by a stripling. Amid the laughter of the robbers, he had to wash the feet of Theseus, and to serve him humbly with meat and drink, and was finally punished for his many cruel murders by being thrown into the sea.

Having received the thanks of the country for ridding it of such a scourge, Theseus traveled on till he came to another village, where he thought he would rest a little.

No sooner had he entered the place, however, than he was surrounded by a number of armed men, who gave him to understand that he was their prisoner.

"Is this the way you treat travelers in your country?" asked he.

"Assuredly," answered the captain of the troop. "You are in the country of King Cercyon, and the law is that no traveler may leave it until he has wrestled with the king."

"I ask for nothing better," said Theseus. "What happens to the traveler if he conquers Cercyon?"

"Then he may pass on."

"But if Cercyon conquers him?"

"Then he is tortured till he dies."

"It is strange," said Theseus, "that I never heard of such a law, or even of King Cercyon."

"Not at all strange," said the captain. "I don't see how you could have heard it, seeing that no traveler has ever lived to tell the tale. Cercyon has conquered and killed them all, as he will conquer and kill you."

And when he saw Cercyon, Theseus could well believe it. The king was of immense height, with broad shoulders, and muscles that stood out like globes of iron. He smiled savagely when he saw Theseus, and stripped without a word. Theseus stripped also, and the two were soon clasping each other like a pair of fierce bears, or, rather, like a bear and a man.

It was a tremendous struggle, with all the brute strength on the side of Cercyon. But Theseus knew a hundred turns and twists of which the savage chieftain knew nothing; and at last, to the amazement of all who witnessed the struggle, Cercyon fell dead upon the ground, with a broken spine. Thenceforth every traveler might pass through that country safely and without fear.

Theseus traveled on until he found himself benighted in a wild country, through which he wandered about until he reached a castle, where he craved a night's shelter. Here he was kindly received, and told that the lord of the castle and of the country round was one Procrustes, who never turned a traveler from his door; nay, even now there were two guests with him. And so it proved. Procrustes entertained Theseus and the other two travelers at supper pleasantly and generously, and when it was time to retire for the night, himself conducted them into a chamber, where a bed, with nothing remarkable about it, stood ready in a corner.

"That is the guest-bed," said Procrustes; "and I hope it will fit you."

"Fit us?" asked Theseus, puzzled.

"Yes; it is the law of the country that if the bed does not fit the traveler, the traveler must be made to fit the bed. Do you try the bed first," he said to one of the guests, the tallest of the three.

The traveler lay down, but found the bed rather short, and had to draw up his knees a little. "Be good enough to lie straight," said Procrustes. He did so, his feet appearing beyond the bottom. Instantly Procrustes, with a sharp hatchet, chopped them off, one after another. "You'll fit nicely now," said he. "It's your turn next," he said to the second traveler.

This one thought himself safe; for, being short, his toes did not reach the bed's end by a full two inches. Procrustes gave a signal, and immediately two strong attendants seized the unfortunate man, one by the shoulders and the other by the legs, and proceeded to pull him out to the proper length, despite his yells of pain.

"Stretch him on the rack," said Procrustes. "Now," he said to Theseus, "it is your turn in the game, and I hope, for your sake, you will give less trouble than the rest of them."

Theseus had been taken aback at first by these extraordinary proceedings; but he now perceived that he had fallen upon another of those brigand chiefs who infested the country, and who resembled ogres rather than mere cruel and bloodthirsty savages.

So he drew his sword and closed with Procrustes; nor did he cease fighting till he had fitted the robber to his own bed by making him a whole head shorter. The robbers in the place, cowed by the death of their chief,

submitted to Theseus, who went round the castle, and set at liberty hundreds of maimed victims of the slain monster's cruelty.

Having received such thanks as they could give him, he journeyed on and on until at last he reached Athens. What he was to do there he did not know; but there was no need for him to ask. Somehow the fame of his deeds had flown before him,—how he had rid the country of Sciron and Cereyon and Procrustes, and other wild beasts and brigands, and he was received as befitted his valor.

Now the King of Athens at that time was Aegeus; and the queen was no other than the great and dreadful sorceress Medea, who had come to Athens after the murder of her children, and had married the king. Aegeus took a fancy to Theseus from the young stranger's first appearance in Athens, gave him a high place at court, and treated him as if he had been his own son. But with Medea it was different. She had a son of her own, and she was filled with jealousy lest Aegeus should make Theseus the heir to his throne. Moreover, she envied and hated him for his courage and his fame, in which he far surpassed her own son Medus; and she feared him too, for she failed to bring him under her spells. So she plotted to destroy him in such a way that his death should never be brought home to her, just as she had made the daughters of Pelias the seeming murderesses of their own father.

She, therefore, pretended a great admiration for Theseus, and got the king to hold a great festival in his honor. It was arranged that Aegeus, during the feast, should send him a golden cup filled with wine, in which Medea secretly steeped one of her deadliest poisons.

All went as she had planned. Aegeus sent the poisoned goblet by one of the cup-bearers to Theseus, who stood up to drink the health of the king and queen. But——

“ Hold! ” suddenly cried Aegeus, starting; “ what sword is that at your side? ”

Theseus put down the cup to answer:

“ It is the sword with which I fought my way to Athens. I wear it to-day as my sword of honor.”

“ But how comes it at your side? ”

Then Theseus told the story of how it had been left by his unknown father under a stone at Troezene, and how his mother’s name was Aethra. Scarcely had he finished, when Aegeus, leaving his throne, fell upon his neck, exclaiming:

“ I was that father! You are my first-born son, and the heir to my crown! ”

The Athenians, who already looked upon Theseus as their national hero, greeted their prince and future king with shouts of joy; and when the first excitement was over, Medea was seen no more. Enraged at the failure of her plot, and fearing discovery and vengeance, she vanished from Athens: some said they had seen her borne by dragons through the air. And this is the last of her.

Freed from her evil influence, the old love of Aegeus for Aethra revived, and he could not make enough of his and Aethra’s son. But Theseus did not become idle, and became in all ways the champion and protector of his father’s people. It was he who caught alive the famous wild bull of Marathon, which had ravaged the country for years, and sacrificed it to Minerva. He never spared himself, and he never failed.

At last, however, drew nigh that evil hour of Athens—that day in every year when the seven youths and seven maidens had to be sent to King Minos of Crete to be devoured by the Minotaur. The rule was to choose the victims by lot: so that none felt safe who had sons and daughters young enough to suit the taste of the monster. The seven girls were first chosen. But when it came to drawing lots for the youths, Theseus said:

“ You need draw only six this year. I will myself be the seventh. It may be that I shall find a way to deliver Athens from this tribute; if not, it is for a prince who cannot save his people to perish with them.”

Ageus was in despair. But no entreaties could turn Theseus from his desperate resolve: neither the prayers of his own father, nor those of all the fathers and mothers in Athens, who would have drawn the seventh lot rather than that he who was the pride and hope of the city should go to certain destruction. The ship which bore the yearly victims to Crete always carried black sails in token of public mourning. Theseus, in order to leave a little hope behind him, promised that, if he came back alive, he would hoist a white sail while returning, so that his safety might be seen from afar. Then, in solemn procession, amid the weeping of the crowd, the youths and maidens embarked in the black-sailed ship, Theseus leading them with the calmness of the only true courage—that which can, in cold blood, face danger for the sake of duty. None would have thought the worse of him had he stayed behind: and if he perished it would be as a mere victim, and without glory. Nor was it as if he were encouraged by any oracles, or helped by gifts from the gods. He is the first hero who was both a mere man and who never had

any help but his own manfulness. And for all these reasons I think that his voyage to Crete is the finest story I have yet told.

When the ship reached Crete, the fourteen victims were conducted to the Labyrinth, there to be imprisoned until they should be given to the Minotaur. As they passed before Minos and his Court, the king's youngest daughter, Ariadne, was filled with pity and love for Theseus, and set her thoughts to work how she might save him from his doom. But how in the world was such a thing to be done? None without the clue could either enter or escape from the maze: and even were that possible, it was not likely that the Minotaur would let himself be balked of his prey.

But she watched and waited: she hovered round the Labyrinth night after night, examining every door: until at last she was rewarded by finding just within one of them, a little silken skein hidden away in a dark corner. The next night, having procured a torch and a sword, she bravely entered the door where the skein was, and, by winding up the silk, followed the clue. Through one twisting passage after another she wandered on and on, up and down long flight of steps, sometimes through great halls confused with columns, and sometimes through tunnels in which it was scarcely possible to stand. There seemed no end to the way. At last, however, the end of the silken thread told her that she had reached the inmost hall: and there her torch showed a sight that froze her with fear.

The victims had been delivered over to the Minotaur. Crowded together in a corner of the hall were six youths and seven girls: stamping and tossing his horned head

was the horrible monster, furious with hunger and the sight of human food. Between the Minotaur and his despairing prey stood Theseus, facing the monster, so that he, by being the first victim, might prolong the lives of the others. He had no hope: he could not even struggle, for his hands were bound behind him with cords.

The sight of his courage gave back Ariadne hers. She darted forward, and cut his bonds with her sword. "Fly!" she cried: "follow me—I have the clue!" But as soon as Theseus felt the touch of the steel, he seized the sword from her hand, and, instead of flying, set upon the Minotaur with such fury that the monster bellowed with rage, amazement, and pain.

It was the hardest fight Theseus had ever fought: the wild bull of Marathon had been nothing to the Minotaur, who fought with a bull's strength and a man's skill and cunning. But the champion of Athens prevailed at last: and the monster fell dead with a groan which echoed through the Labyrinth like the bellowing of thunder.

"It will wake the whole city!" cried Ariadne: "follow me!" Theseus and his companions, scarce knowing that they were saved, followed Ariadne, who wound up the clue as she ran. When they reached the entrance-gate, the alarm of their escape had been given. Making straight for the shore, they found their black-sailed ship, sped on board, and, thanks to a kindly wind, were out at sea before they could be pursued.

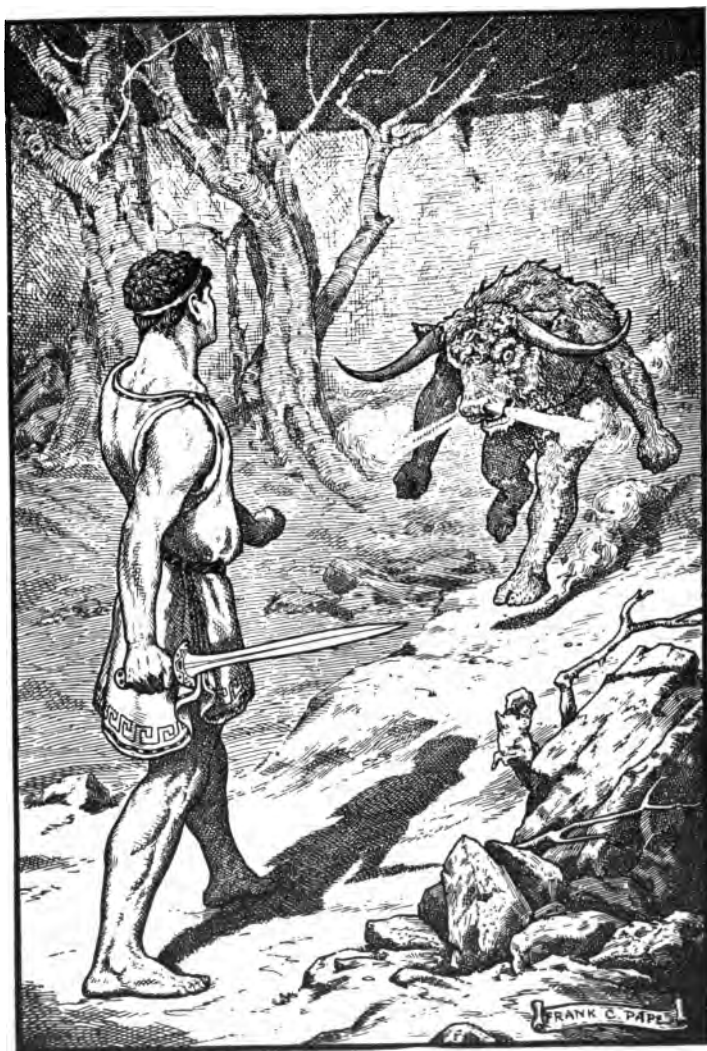
The wind carried them to the island of Naxos: and here they remained—Theseus, Ariadne, and the rest—till the breeze should blow towards Athens. Such a breeze

came in time; and then Theseus set sail for home with his thirteen companions, leaving Ariadne behind, to her great sorrow. Nor can anything make me believe that he meant this for a real parting, or that she thought so. One can think of many reasons why she should remain in Naxos for a while: it is quite certain that her powerful father Minos, who had already conquered the Athenians, and shown, by a cruel vengeance, how he hated them, would have attacked them again with all his fleets and armies if he had heard that they were giving shelter to a daughter who had betrayed him. So, leaving Ariadne safe in Naxos, Theseus returned to Athens as the savior of his city and the slayer of the Minotaur.

Meanwhile his father, Aegeus, had been every day and all day long looking out to sea from the farthest point of the shore for the return from Crete of the ship of mourning. He had but little hope, but nobody can help having a little: nor did he quite despair, until one morning he saw on the horizon a vessel which he felt sure was the one he was watching for in such agony of mind. Nearer and nearer it came—alas! its sails were still as black as when it was outward bound. Theseus had forgotten to hoist the white sail which was to be the sign of safety.

So Aegeus, giving up his son for lost, threw himself into the sea and perished, just when Theseus was within sight of home. And that sea is called the Aegean, or the Sea of Aegeus, to this day. And thus Theseus, to the joy of the people, but with sorrow in his own heart, found himself king.

And the best of kings he made. The strength of his rule was only equaled by its gentleness. He made wise laws; he took care that all men received justice; he



THESEUS AND THE MINOTAUR

(Illustration by Frank C. Pape from Storr's "Half a Hundred Hero Tales")

honored the gods; he obtained the respect and friendship of foreign nations; he taught the Athenians to be free, and to govern themselves, so that, when he died, they remained as great a people as while he was alive.

He sent for his mother, Aethra, and kept her in all love and honor. I wish I could tell you that he sent for Ariadne also. But he never had any other wife: and she was lost to him. There is a strange, mysterious story of how, when she was left sorrowing in Naxos, the god Bacchus—the god of the bounty of Nature and of the joy that men and women find in her—comforted Ariadne, and made her his bride, and raised her above the earth, giving her a crown of seven stars, which is still to be seen in the sky, and is called “Ariadne’s Crown.”

—R. E. FRANCILLON: From *Gods and Heroes*.
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ARIADNE'S CROWN

WHEN Bæchus first beheld the desolate
And sleeping Ariadne, wonder straight
Was mixed with love in his great golden eyes;
He turned to his Bacchantes in surprise,
And said with guarded voice,—“Hush! strike no more
Your brazen cymbals; keep those voices still
Of voice and pipe;”—the miserable Fair
Awoke at last, sprang upward from the sands,
And gazing wild on that wild throng that stands
Around, around her, and no Theseus there!—
Her voice went moaning over shore and sea,
Beside the halcyon’s cry; she called her love;

She named her hero, and raged maddeningly

Against the brine of waters; and above,
Sought the ship's track, and cursed the hours she slept;
And still the chiefest execration swept
Against Queen Paphia, mother of the ocean;
And cursed and prayed by times in her emotion
The winds all round . . .

Her grief did make her glorious; her despair
Adorned her with its weight. Poor wailing child!
She looked like Venus when the goddess smiled
At liberty of godship, debonair;
Poor Ariadne! and her eyelids fair
Hid looks beneath them lent her by Persuasion
And every Grace, with tears of Love's own passion.
She wept long; then she spake:—" Sweet sleep did come
While sweetest Theseus went. Oh, glad and dumb,
I wish he had left me still! for in my sleep
I saw his Athens, and did gladly keep
My new bride-state within my Theseus' hall;
And heard the pomp of Hymen, and the call
Of " Ariadne, Ariadne," sung
In choral joy; and there, with joy I hung
Spring-blossoms round love's altar!—ay, and wore
A wreath myself; and felt *him* evermore,
Oh, evermore beside me! with his mighty
Grave head bowed down in prayer to Aphrodité!
Why, what a sweet, sweet dream! *He* went with it,
And left me here unwedded where I sit!

And while I dreamed of marriage, as I say,
And blest it well, my blessed Theseus left me:
And thus the sleep, I loved so, has bereft me.
Speak to me, rocks, and tell my grief to-day,
Who stole my love of Athens? " . . .

Then Bacchus' subtle speech her sorrow crossed:—

“ O maiden, dost thou mourn for having lost
The false Athenian heart? and dost thou still
Take thought of Theseus, when thou mayest at will
Have Bacchus for a husband? Bacchus bright!

A god in place of mortal! Yes, and though
The mortal youth be charming in thy sight,
That man of Athens cannot strive below,
In beauty and valor, with my deity!

Thou'lt tell me of the labyrinthine dweller,
The fierce man-bull he slew: I pray thee, be,
Fair Ariadne, the true deed's true teller,
And mention thy clue's help! because, forsooth,

Thine armed Athenian hero had not found
A power to fight on that prodigious ground,
Unless a lady in her rosy youth
Had lingered near him: not to speak the truth
Too definitely out till names be known—
Like Paphia's—Love's—and Ariadne's own.

Thou wilt not say that Athens can compare
With Aether, nor that Minos rules like Zeus,
Nor yet that Gnosus has such golden air

As high Olympus. Ha! for noble use
We came to Naxos! Love has well intended
To change thy bridegroom! Happy thou, defended
From entering in thy Theseus' earthly hall,
That thou mayst hear the laughters rise and fall

Instead, where Bacchus rules! Or wilt thou choose
A still-surpassing glory?—take it all,—
A heavenly house, Kronion's self for kin,—
A place where Cassiopeia sits within
Inferior light, for all her daughter's sake,
Since Perseus, even amid the stars, must take

Andromeda in chains aethereal!

But *I* will wreath *thee*, sweet, an astral crown,
And as my queen and spouse thou shalt be known—
Mine, the crown-lover's! ' ' Thus, at length, he proved
His comfort on her; and the maid was moved;
And casting Theseus' memory down the brine,
She straight received the troth of her divine
Fair Bacchus; Love stood by to close the rite;
The marriage-chorus struck up clear and light,
Flowers sprouted fast about the chamber green,
And with spring-garlands on their heads, I ween,
The Orchomenian dancers came along
And danced their rounds in Naxos to the song.
A Hamadryad sang a nuptial dit

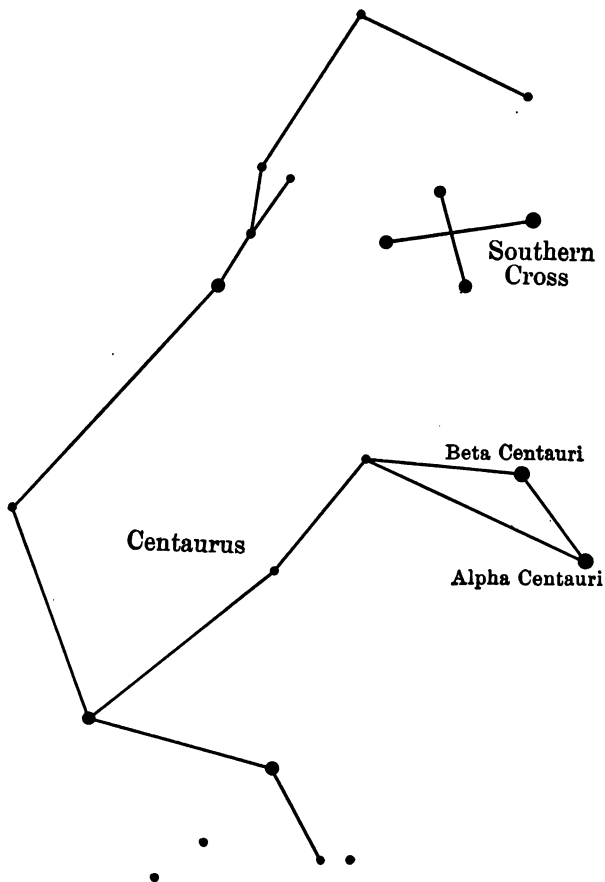
Right shrilly: and a Naiad sat beside
A fountain, with her bare foot shelving it,
And hymned of Ariadne, beauteous bride,
Whom thus the god of grapes had deified.

Ortygia sang out, louder than her wont,
An ode which Phoebus gave her to be tried,
And leapt in chorus, with her steadfast front,
While prophet Love, the stars have called a brother,
Burnt in his crown, and twined in one another
His love-flower with the purple roses, given
In type of that new crown assigned in heaven.

—NONNUS, translated by Mrs. Browning.

CENTAURUS AND THE SOUTHERN CROSS

These are the most interesting constellations of the far south, but to most of the northern hemispheres they are invisible.



ALPHA CENTAURI AND THE SOUTHERN CROSS

FAR in the south, and near the southern Pole, are two objects which we must not fail to mention; one is Alpha Centauri, our sun's nearest known neighbor sun, and the other is the Southern Cross. Alpha Centauri and Beta Centauri are the two first-magnitude stars in the constellation Centaurus, and are sometimes called the "southern pointers," because they point to the Southern Cross. Alpha Centauri is the brighter, and is 4.3 light years away from us. When we consider that light travels 186,400 miles a second, and recall the number of seconds in a year, it makes us feel very much alone in space to know that the light we see to-night started from our nearest neighbor nearly four and a half years ago. The Southern Cross is a tiny constellation of four stars—one first magnitude, two second magnitudes, and one third magnitude—that form almost a perfect cross; and it is world-wide famous because of the beauty of these four bright stars so close together in a figure with so many romantic and religious associations.

CONSTELLATIONS

O CONSTELLATIONS of the early night,
That sparkled brighter as the twilight died,
And made the darkness glorious! I have seen
Your rays grow dim upon the horizon's edge,
And sink behind the mountains. I have seen
The great Orion, with his jewelled belt,
That large-limbed warrior of the skies, go down
Into the gloom. Beside him sank a crowd
Of shining ones. I look in vain to find
The group of sister-stars, which mothers love
To show their wondering babes, the gentle Seven.
Along the desert space mine eyes in vain
Seek the resplendent cressets which the Twins
Uplifted in their ever-youthful hands.
The streaming tresses of the Egyptian Queen
Spangle the heavens no more. The Virgin trails
No more her glittering garments through the blue.
Gone! all are gone! and the forsaken Night,
With all her winds, in all her dreary wastes,
Sighs that they shine upon her face no more.
Now only here and there a little star
Looks forth alone. Ah me! I know them not,
Those dim successors of the numberless host
That filled the heavenly fields, and flung to earth
Their quivering fires. And now the middle watch
Betwixt the eve and morn is past, and still
The darkness gains upon the sky, and still
It closes round my way. Shall, then, the Night

Grow starless in her later hours? Have these
No train of flaming watchers, that shall mark
Their coming and farewell? O Sons of Light!
Have ye then left me ere the dawn of day
To grope along my journey sad and faint?

Thus I complained, and from the darkness round
A voice replied—was it indeed a voice,
Or seeming accents of a waking dream
Heard by the inner ear? But thus it said:
O Traveler of the Night! thine eyes are dim
With watching; and the mists, that chill the vale
Down which thy feet are passing, hide from view
The ever-burning stars. It is thy sight
That is so dark, and not the heavens. Thine eyes,
Were they but clear, would see a fiery host
Above thee; Hercules, with flashing mace,
The Lyre with silver chords, the Swan uppoised
On gleaming wings, the Dolphin gliding on
With glistening scales, and that poetic steed,
With beamy mane, whose hoof struck out from earth
The fount of Hippocrene, and many more,
Fair clustered splendors, with whose rays the Night
Shall close her march in glory, ere she yield
To the young Day, the great earth steeped in dew.

So spake the monitor, and I perceived
How vain were my repinings, and my thought
Went backward to the vanished years and all
The good and great who came and passed with them,
And knew that ever would the years to come
Bring with them, in their course, the good and great,
Lights of the world, though, to my clouded sight,
Their rays might seem but dim, or reach me not.

—WILLIAM CULLEN BRYANT.

OTHER STORIES OF THE STARS

Up to this point the myths I have told you are the ones made famous by the Greeks, Romans, and Egyptians, and often repeated by the poets of Europe. They are not the only stories of the stars, however. The people in other parts of the world have told stories to suit themselves. I believe you will be entertained by some of those.

GENERAL MYTHS

THE birth of myth was in the endeavor of primitive man to interpret the meaning of his surroundings. Myth, with its prolific offspring, legend and tradition, was the necessary travailing through which the mind of man had to pass in its slow progress toward certitude. His sole measure of things was himself; consequently, he thought that everything that moved, or that had power of movement, did so because, like him, it was alive. A personal life and will was attributed to sun, moon, clouds, river, waterfall, ocean, and tree; and the varying phenomena of the sky at dawn or noonday, at gray eve or black-clouded night, were the manifestation of the controlling life that dwelt in all. In a thousand different forms this conception was expressed. The thunder was the roar of a mighty beast; the lightning a serpent darting at his prey, an angry eye flashing, the storm demon's outshot tongue; the rainbow a thirsty monster; the waterspout a long-tailed dragon. This was not a pretty or powerful figure of speech, not imagery, but an explanation. The men who thus spoke of these phenomena meant precisely what they said. What does the savage know about heat, light, sound, electricity, and other modes of motion? How many persons who have enjoyed a "liberal" education can give correct answers, if asked off-hand to explain how glaciers are born of the sunshine, and why two sounds, traveling in opposite directions at equal velocities, "interfere" and cause a silence?

Obviously, the richest and most suggestive material for myths would be supplied by the striking phenomena of the heavens, chiefly in sunrise and sunset, in moon, star, star-group, and meteor, in cloud and storm; and, next in importance, by the strange and terrible among phenomena on earth, whether in the restless waters, the unquiet trees, the grotesquely shaped rocks, or the fear inspired in man by creatures more powerful than himself. Through the whole range of the lower culture, sun, moon, and constellations are spoken of as living creatures, often as ancestors, heroes, and benefactors who have departed to the country above, to heaven, the *heaved*, uplifted land. Among the Red Races, one tribe thought the sun, moon, and stars were men and women who went into the sea every night and swam out by the east. The Bushmen say that the sun was once a man who shed light from his body, but only for a short distance, until some children threw him into the sky while he slept, and thus he shines upon the wide earth. The Australians say that all was darkness around them till one of their many ancestors (who still shine from the stars, shedding good and evil) threw, in pity for them, an emu's egg into space, when it became the sun. Among the Manacicas of Brazil, the sun was their culture-hero, . . . and their jugglers, who claimed power to fly through the air, said that his luminous figure, like that of a man, could be seen by them, though too dazzling for common mortals to see.

The sun has been stayed in his course in other places than Gibeon, although by mechanical means, of which Joshua appears to have been independent. Among the many exploits of Maui, abounding in Polynesian myth, are those of his capture of the sun. He had, like

Prometheus, snatched fire from heaven for mortals; and his task was to cure Ra, the sun-god, of his trick of setting before the day's work was done. So Maui plaited thick ropes of cocoa-nut fiber, and, taking them to the opening through which Ra climbed up from the nether world, he laid a slip-noose for him, placing the other ropes at intervals along his path. Lying in wait as Ra neared, he pulled the first rope, but the noose only caught Ra's feet. Nor could Maui stop him until he reached the sixth rope, when he was caught around the neck and pulled so tightly by Maui that he had to come to terms, and agree to slacken his pace for the future. Maui, however, took the precaution to keep the ropes on him, and they may still be seen hanging from the sun at dawn and eve. In Tahitian myth, Maui is a priest, who, in building a house which must be finished by daylight, seizes the sun by its rays and binds it to a tree till the house is built. In North American myth, a boy snared the sun, and there was no light on the earth. So the beasts held council who should undertake the perilous task of cutting the cord, when the dormouse, then the biggest among them, volunteered. And it succeeded, but so scorched was it by the heat that it was shriveled to the smallest of creatures.

In Indian myth we read that the moon is the sun's sister, an aged, pale-faced woman. In Australian myth, the moon's motions are explained as due to the chase of a jealous husband, one of the bright stars, who found his wife in the act of eloping with the moon. Among the Bushmen, the moon has incurred the sun's anger, and is hacked smaller and smaller by him, till, begging for mercy, a respite is given. But as soon as he grows larger the sun hacks him again. In Slavonic myth the

sun cleaves him through for loving the morning star. The Indians of the far west say that, when the moon is full, evil spirits begin nibbling at it, and eat a portion every night till it is all gone; then a great spirit makes a new moon, and, weary with his toil, falls asleep, when the bad spirits renew the attack. Another not uncommon group of myths is that which speaks of sun and moon as borne across the heavens on the backs of ancestors, as in the Greek myth Atlas supports the world.

But a still larger and more widespread body of myth has its source in the patches on the moon's face. In the Samoan Islands these are said to be a woman, a child, and a mallet. A woman was once hammering out paper cloth, and, seeing the moon rise, looking like a great bread-fruit, she asked it to come down and let her child eat a piece of it. But the moon was very angry at the idea of being eaten, and gobbled up woman, child, and mallet, and there they are to this day. The Selish Indians of Northwestern America say that the little wolf was in love with the toad, and pursued her one moonlight night, till, as a last chance, she made a desperate spring onto the face of the moon, and there she is still. In Greenland myth, the moon was in love with his sister, and stole in the dark to caress her. She, wishing to find out who her lover was, blackened her hands so that the marks might be left on him, which accounts for the spots. The Khasias of the Himalayas say that the moon falls in love every month with his mother-in-law, who, like a well-conducted matron, throws ashes in his face.

Comparing these with our familiar myths, we have our own Man in the Moon, who is said to be the culprit found by Moses gathering sticks on the Sabbath, al-

though his place of banishment is a popular addition to the Scripture narrative. According to the German legend, he was a scoffer who committed the same heinous offense on a Sunday, and was given the alternative of being scorched in the sun or frozen in the moon. The Frisians say that he stole cabbages, the load of which he still bears on his back. In Icelandic myth the two children familiar to us as Jack and Jill were kidnaped by the moon, and there they stand to this day, with bucket on pole across their shoulders, falling away one after the other as the moon wanes, a phase described in the couplet:

Jack fell down and broke his crown,
And Jill came tumbling after.

Poetry has made the man in the moon its theme. Dante calls him Cain: Chaucer describes him

Bearing a bush of thorns on his back,
Which for his theft might climb so near the heaven;

and Shakespeare refers to him in "Midsummer Night's Dream" and the "Tempest."

"Revenons à nos moutons," as the impatient client who had lost some sheep reminded his rambling advocate.

In the great body of nature-myth, the stars are prominent members. In their multitude; their sublime repose in upper calms above the turmoil of the elements; their varying brilliancy, "one star differing from another star in glory"; their tremulous light; their scattered positions, which lend themselves to every vagary

of the constellation-maker; their slow procession, varied only by sweeping comet and meteor, or falling showers of shooting stars; they lead the imagination into gentler ways than do the vaster bodies of the most ancient heavens. Nor,—although we may compute their number, weigh their volume, in a few instances reckon their distance, and, capturing the light that has come beating through space for unnumbered years, make it reveal the secret of their structure,—is the imagination less moved by the clear heavens at night, or the feeling of awe and reverence blunted before that “mighty sum of things for ever speaking.”

In barbaric myth the stars are spoken of as the children of the sun and the moon, but more often as men who have lived on the earth, translated without seeing death. The single stars are individual chiefs or heroes; the constellations are groups of men or animals. To the natives of Australia the brilliant Jupiter is a chief among the others, and the stars in Orion's belt and scabbard are young men dancing a corroboree, the Pleiades being girls playing to them. The Kasirs of Bengal say that the stars are the men who climbed to the top of a tree, and were left in the branches when the trunk was cut away. To the Eskimos the stars in Orion are seal-hunters who have missed their way home; and in German folklore they are spoken of as the mowers, because, as Grimm says, “they stand in a row, like mowers in a meadow.” In North American myth two of the bright stars are twins who have left a home where they were harshly treated, and leapt into the sky, whither their parents followed them, and ceaselessly chase them. In Greek myth the faintest star of the seven Pleiades is Merope, whose light was dimmed be-

cause she alone among her sisters married a mortal. In German starlore, the small star just above the middle one in the shaft of Charles's Wain, is a wagoner, who, having given our Saviour a lift, was offered the kingdom of heaven for his reward, but who said he would sooner be driving from east to west to all eternity, and whose desire was granted.

The Housatonic Indians say that the stars in Charles's Wain are men hunting a bear, and that the chase lasts from spring to autumn, when the bear is wounded, and its dripping blood turns the leaves of the trees red. With this may be cited the myth that the red clouds at morn and eve are the blood of the slain in battle. In the Northern Lights, the Greenlanders see the spirits of the departed dancing, the brighter the flash of the Aurora the greater the merriment; whilst the Dacotahs say of the meteors that they are spirits flying through the air.

Of the Milky Way,—so called because Hera, indignant at the bantling Herakles's being put to her breast, spilt her milk along the sky,—the Ottawas say that it was caused by a turtle swimming along the bottom of the sky, and stirring up the mud. According to the Patagonians, it is the track along which the departed tribesmen hunt ostriches; in African myth it is some wood-ashes long ago thrown up into the sky by a girl, that her people might be able to see their way home at night; in Eastern myth, it is chaff dropped by a thief in his hurried flight.

But the idea of a land beyond the sky—be it the happy hunting ground of the Indian, or the Paradise of Islam, or the New Jerusalem of the Apocalypse—would fail to be imagined, and in both the Milky Way a

Rainbow barbaric fancy sees the ladders and bridges whereby the departed pass from earth to heaven. So we find in the lower and higher culture alike the beautiful conceptions of the *chemin des âmes*, the Red Man's road of the dead to their home in the sun; the ancient Roman path of, or to, the gods; the road of the birds, in Lithuanian myth, because the winged spirits flit thither to the free and happy land. In prosaic contrast to all this, it is curious to find among the people living in England the Milky Way described as Watling Street! That famous road, which ran from Tichborough through Canterbury and London to Chester, now gives its name to a narrow, bustling city street. But who the Waetlings were and why their name was transferred from Britain to the sky, we do not know, although the fact is plainly enough set down in old writers, foremost among whom is Chaucer. In his "House of Fame" (II, 427) he says:—

'Now,' quod he tho, 'cast up thyn ye;
See yonder, lo, the Galaxye,
The which men clepe the Milky Wey,
For hit is white: and somme, parfey,
Callen hit Watlyngë strete.'

—Selected from EDWARD CLODD'S "The Birth and Growth of Myth," published in *Knowledge*.

DARKNESS

I HAD a dream, which was not all a dream.
The bright sun was extinguished, and the stars
Did wander darkling in the eternal space,
Rayless, and pathless, and the icy Earth

Swung blind and blackening in the moonless air;
Morn came and went—and came, and brought no day,
And men forgot their passions in the dread
Of this their desolation; and all hearts
Were chilled into a selfish prayer for light:
And they did live by watchfires—and the thrones,
The palaces of crownèd kings—the huts,
The habitations of all things which dwell,
Were burnt for beacons; cities were consumed,
And men were gathered round their blazing homes
To look once more into each other's face;
Happy were those who dwelt within the eye
Of the volcanos and their mountain-torch:
A fearful hope was all the World contained;
Forests were set on fire—but hour by hour
They fell and faded—and the crackling trunks
Extinguished with a crash—and all was black.
The brows of men by the despairing light
Wore an unearthly aspect, as by fits
The flashes fell upon them; some lay down
And hid their eyes and wept; and some did rest
Their chins upon their clenched hands, and smiled;
And others hurried to and fro, and fed
Their funeral piles with fuel, and looked up
With mad disquietude on the dull sky,
The pall of a past World; and then again
With curses cast them down upon the dust,
And gnashed their teeth and howled: the wild birds
shrieked,
And, terrified, did flutter on the ground,
And flap their useless wings; the wildest brutes
Came tame and tremulous; and vipers crawled
And twined themselves among the multitude,

Hissing, but stingless—they were slain for food:
And War, which for a moment was no more,
Did glut himself again:—a meal was bought
With blood, and each sate sullenly apart
Gorging himself in gloom: no Love was left;
All earth was but one thought—and that was Death,
Immediate and inglorious; and the pang
Of famine fed upon all entrails—men
Died, and their bones were tombless as their flesh;
The meager by the meager were devoured,
Even dogs assailed their masters, all save one,
And he was faithful to a corse, and kept
The birds and beasts and famished men at bay,
Till hunger clung them, or the dropping dead
Lured their lank jaws; himself sought out no food,
But with a piteous and perpetual moan,
And a quick desolate cry, licking the hand
Which answered not with a caress—he died.
The crowd was famished by degrees; but two
Of an enormous city did survive,
And they were enemies: they met beside
The dying embers of an altar-place
Where had been heaped a mass of holy things
For an unholy usage; they raked up,
And shivering scraped with their cold skeleton hands
The feeble ashes, and their feeble breath
Blew for a little life, and made a flame
Which was a mockery; then they lifted up
Their eyes as it grew lighter, and beheld
Each other's aspects—saw, and shrieked, and died—
Even of their mutual hideousness they died,
Unknowing who he was upon whose brow
Famine had written Fiend. The World was void,

The populous and the powerful was a lump,
Seasonless, herbless, treeless, manless, lifeless—
A lump of death—a chaos of hard clay.
The rivers, lakes, and ocean all stood still,
And nothing stirred within their silent depths;
Ships sailorless lay rotting on the sea,
And their masts fell down piecemeal; as they dropped
They slept on the abyss without a surge—
The waves were dead; the tides were in their grave,
The Moon, their mistress, had expired before;
The winds were withered in the stagnant air,
And the clouds perished; Darkness had no need
Of aid from them—She was the Universe.

—LORD BYRON.

DEATH OF WORLDS

I AM often asked, when I have shown how (so far as science can judge) all the orbs in space seem to tend towards death, whether there may not be some way in which this seeming tendency may be counterbalanced by some restorative forces. When one has to reply that science does not at present recognize any such forces, that the theories devised by Mattieu, Williams, Siemens, and others to that end are not only not supported by scientific evidence, but directly opposed to it, the idea seems commonly entertained that science rejects the belief in any restriction of the energies which seem passing continually away from suns and planets. Yet, in reality, such a reply means nothing of the sort. On the contrary, it is as certain that science has shown nothing *against* the existence of any restorative forces, as it is

that science has as yet shown nothing in favor of such a process. Science simply knows nothing either one side or the other. And I think if men rightly understood the limitations of scientific research, they would see no reason to wonder that science should be thus unable to reply to a question so exceedingly difficult. Our knowledge has grown more and more, and is ever growing more and more, till it seems as though it would eventually extend over all time and all space; yet it is in reality, and ever must be, extremely limited compared with what actually is. In regard to the question of the seeming wasting away, slowly, yet surely, of the life of every sun and every planet, we are much in the position of creatures whose whole lives, lasting but a few days, perhaps, would be, if placed beside a running river. They should learn, if they had the power of reasoning, that the waters of the river were passing continually away in one direction; and they would be apt to infer that unless the store of water were infinite, the supply must at length be exhausted. If we imagine them combining together information derived from others of their kind, up stream and down stream within limited distances, and also storing up, for what would seem to them a long period of time, the information gathered by generation after generation, they would learn that the river was broader lower down and narrower higher up, and that it had remained (on the whole) without appreciable change. They might even, we may imagine, learn how the river was fed by smaller streams, how it flowed into a large river, that into yet larger rivers, and so (possibly they might learn to guess) into a sea of extent, to their minds, practically infinite. Still their science could give no answer to the question

how the river might not really waste away, as it seemed to be wasting (though inappreciably in long periods of their time). The actual process of restoration, which, to us, seems so simple a matter, could not possibly suggest itself to creatures having their limited knowledge and experience. That the air in which they lived contained the stores from which the river, unlike them in all respects, was constantly nourished, would seem incredible if suggested to them; but, as a matter of fact, the idea would be to them utterly inconceivable. It would not occur to their minds at all. By parity of reasoning, we may well believe that the way in which the energies of suns and planets are continually restored, if (as I believe myself must be the case) they are restored at all, is utterly outside the range of our knowledge and experience. Thus understood as suggesting the kind of way, not the way itself, in which such restoration may be effected, the following strictly unscientific ideas may be regarded as admissible. Men were long deceived in regard to space,—they thought this world all-important in space, whereas now they know it to be the merest point compared with the solar system, this system the merest point compared with the distances separating star from star, and the whole of the system of stars utterly lost in unfathomable depths of space. Men were deceived with regard to time,—they thought the duration of this earth represented all time; was, at least, central in time; they know it now to be the merest second compared with the duration of the solar system, the duration of this a mere moment compared with the uncounted aeons of whose progress the star-depths tell us, and even these as nothing compared with the eternities of past and future time amid which they are

lost. May it not well be, then, that, as men have deceived themselves with regard to both space and time, so also have they deceived themselves with regard to the very structure of the universe itself? May it not well be that the solid, liquid, and vaporous forms of matter with which alone we are acquainted are not the only forms of matter which exist? May there not be a higher order of universe, of which the suns and planets of the universe we know of are but as the atoms and molecules? May there not be a lower, or, rather, a rarer, order of universe, as much finer in texture, so to speak, as that imagined higher order is in a sense grosser? But we know that there is a rarer order of universe—the ether of space—which permeates our universe, flowing through the densest solids as the breeze passes through the forest trees. The waste energies of stars and planets are expended in the ether of space. May they not subserve within it important purposes, though we may not be able to conceive how? May they not continually revivify that universe, while, in turn, our universe is continually refreshed and restored by receiving supplies of energies passed on to us from a higher order of universe? And thus, from higher and higher orders of universe, absolutely without end on one side, to lower and lower orders as absolutely without end on the other side, there may be constant interchange of energy, instead of the dying out of any one among these various orders of material universe.

All this, as I have said, is outside science. For science deals with what we know of, what we can observe, analyze, and investigate, while these interchanges of life and energy we can never analyze or test. But thus it is in whatever direction we investigate the universe. On

all sides we reach the unknown, the unknowable. We approach in every case the threshold of infinity—infinite space and infinite time, infinite power and infinite variety. In dealing with infinity we are dealing with what is for us absolutely inconceivable, though its existence is absolutely certain.

—RICHARD A. PROCTOR.

AN ODE

THE spacious firmament on high,
With all the blue ethereal sky,
And spangled Heavens, a shining frame,
Their great Original proclaim.
Th' unweary'd Sun from day to day
Does his Creator's power display;
And publishes, to every land,
The work of an immortal hand.

Soon as the evening shades prevail,
The Moon takes up the wondrous tale;
And nightly, to the listening Earth,
Repeats the story of her birth:
Whilst all the stars that round her burn,
And all the planets, in their turn,
Confirm the tidings as they roll,
And spread the truth from pole to pole.

What though, in solemn silence, all
Move round the dark terrestrial ball;
What though no real voice, nor sound
Amidst their radiant orbs be found:

In reason's ear they all rejoice,
And utter forth a glorious voice;
Forever singing as they shine:
"The hand that made us is divine."

—JOSEPH ADDISON.

ASTRONOMY THROUGH THE AGES

THE “perfect Science,” as astronomy is sometimes called, is the oldest of the sciences, and its course has been as turbulent as long. In no other science have what appeared to be facts so stubbornly contested every inch of ground with real facts. The earth looked flat. The sun seemed to rise and set. All the hosts of stars sank into the sea at evening, and swam out in the east in the morning. All evidence to disprove these illusions was held in abhorrence until almost our own age was reached.

The primitive man believed that all creation had life, and a will to do good and evil. It was out of this belief that the myths grew up. Then the constellations were marked off, and named after the heroes of the stories, and were incorporated into the literature of the times. Homer, in the *Iliad*, probably one thousand years before Christ, tells us about a wonderful shield that one of the gods made for the hero Achilles, on which he placed some of the constellations, which may have been about all known to him at that time:

“First fashioned he a shield great and strong, adorning it all over, and set thereto a shining rim, triple, bright-glancing, and therefrom a silver baldrick. Five were the folds of the shield itself; and therein fashioned he much cunning work from his wise heart.

“There wrought he the earth, and the heavens, and the sea,

and the unwearying sun, and the moon waxing to the full, and the signs every one wherewith the heavens are crowned, Pleiads and Hyads and Orion's might, and the Bear that men call also the Wain, her that turneth in her place and watcheth Orion, and alone hath no part in the baths of Ocean."

About four centuries before Christ, Eudoxus brought from Egypt to Athens an improved celestial sphere, and a century and a half later the poet Aratus, who was then the court poet at Macedonia, sang of the stories of the stars and of their positions in the heavens. A few years after Christ, between 125 and 150 A.D., Ptolemy made the first accurate star charts, and propounded his philosophy that our little world was the center of the universe, and that all creation was for our edification. This explanation of the universe had been the regular belief of men long before Ptolemy, and continued to be so long after him. As late as the seventeenth century it was adopted by Milton (there is reason to think he did not really believe in it) as the basis for "Paradise Lost," although a century before his time Copernicus had conceived the simple truth that the world turned on its axis. At the time of Milton the wonderful Galileo had made his name immortal by the invention of the telescope, an instrument which has made our greatly advanced astronomy of to-day possible.

At last truth came into her own, and the past two centuries have seen stupendous strides in astronomy. Observatories have been established all over the world. Brilliant and skilled men work in them; and by their labors benefit beyond all estimate has been rendered to the men of the sea and of the land. The great saving of life at sea can never be known. And it is highly

probable that the advanced astronomy of to-day saves more money in the transactions of business than it costs to run all our observatories.

Telescopes were made larger and larger, with better and better lenses, until they reached almost the acme of perfection. It began to look as if the limits of progress had been nearly reached: there was no way to learn those secrets of the stars that the telescope failed to penetrate. But human ingenuity, not to be balked, goes on finding new instruments to supplement the telescope or the eye. The photographer has given us a sort of new eye. A photographic apparatus attached to a telescope records many things that escape the eye, because the plate can be exposed for hours and hours, while the eye becomes tired and dull in a very short time. To mention but a single example, the vast nebula surrounding the Pleiades has been shown to us. At Harvard Observatory in Cambridge, Mass., Professor Pickering is having the whole sky photographed on long time exposures. Very careful records are kept of all the plates, and they are examined with minute care in the search for new stars. These pictures of the sky will make by far the most perfect star charts that the world has ever known, and will be a wonderful gift to pass on to the generations who will follow us.

Another discovery which we will mention will be a little harder to understand, but more interesting. And while you cannot understand the principles perfectly until you have studied physics and chemistry, you can still enjoy the revelations. You, perhaps, know that our light comes to us in waves like the water waves on the seashore, or the little waves that come rolling in when you cast a stone into a brook. The length of the tiny

light waves is so extremely small that we can scarcely conceive of them. Yet an instrument has been made that can measure them. It is called the spectroscope, and the fundamental part of it is a prism. It may be that you have looked through prisms. "I shall never forget the pleasure I had with them when I was a small child. My grandmother had a swinging lamp hung from the parlor ceiling; its shade was decorated with dozens of prisms dangling from the edges. If one slipped from its chain, I secured it with glee; and when I looked at things through it, every object seemed to be laced about with a rainbow." The picture of colored bands that the light makes when passing through the spectroscope is called the spectrum of the object from which the light comes. This picture is like our rainbow, which is a genuine spectrum. Now, different solids and gases, at white heat, have different spectra; so, by examining the spectrum of the light from a certain star, the scientist can tell of what material the star is composed.

Nor is this all that the spectroscope tells us. While these many-banded pictures were being examined, it was detected that the spectra of some stars seemed compressed, as if the light waves were beating down upon them; of other stars the spectra seemed to be dispersed, as if something was retarding the light waves. Analysis of this condition revealed that the spectrum seemed to be compressed when the star was moving towards us, and that the spectrum seemed to be dispersed when the star was moving away from us. So at last science had, in a sense, compassed the vast inconceivable distances of space, and was able almost directly to measure the motion of the stars as they approach us and leave us. By comparing the spectrum of a star with the spectrum

of an object at rest, and making some mathematical calculations, it can be determined with what speed the star which gives the compressed spectrum is approaching us, and with what speed the star which gives the dispersed spectrum is leaving us.

In the last four or five years of the nineteenth century, it was found that the Pole Star is approaching us at a great speed that changes every four days. These changes show that Polaris is whirling around some dark object—dark, else we could see it—as our moon goes around the earth, but at a tremendous speed, making its circuit in four days. But all the while this system is coming on through space at a still greater speed. When Polaris is on her backward voyage around this dark companion, her motion towards us is the difference between her motion around it, and the motion of the system towards us, just as if you were running backwards through a swiftly moving train. But when Polaris is coming on around, her speed towards us is the sum of the motion of the system towards us and her motion around her companion, just as if you were running forward in a swiftly moving train.

The distance of a star from the earth makes no difference in its treatment with a spectroscope. The light from Polaris that reaches us to-night started on its journey over fifty years ago, and has been traveling 186,400 miles a second during all these years. Yet it comes with all its inherent qualities, and tells us the secrets of its creator.

ASTRONOMICAL OBSERVATORIES

AN ADDRESS DELIVERED IN 1856

THE object of an observatory, erected and supplied with instruments of admirable construction, and at proportionate expense, is, as I have already intimated, to provide for an accurate and systematic survey of the heavenly bodies, with a view to a more correct and extensive acquaintance with those already known, and, as instrumental power and skill in using it increase, to the discovery of bodies hitherto invisible, and in both classes to the determination of their distances, their relations to each other, and the laws which govern their movements.

Why should we wish to obtain this knowledge? What inducement is there to expend large sums of money in the erection of observatories, and in furnishing them with costly instruments, and in the support of the men of science employed in making, discussing, and recording, for successive generations, these minute observations of the heavenly bodies?

What is the use of an observatory, and what benefit may be expected from the operations of such an establishment in a community like ours?

In the first place, then, we derive from the observations of the heavenly bodies which are made at an observatory, our only adequate measures of time, and our only means of comparing the time of one place with the time of another. Our artificial time-keepers—clocks,

watches, and chronometers—however ingeniously contrived and admirably fabricated, are but a transcript, so to say, of the celestial motions, and would be of no value without the means of regulating them by observation. It is impossible for them, under any circumstances, to escape the imperfection of all machinery the work of human hands; and the moment we remove with our time-keeper east or west, it fails us. It will keep home time alone, like the fond traveler who leaves his heart behind him. The artificial instrument is of incalculable utility, but must itself be regulated by the eternal clock-work of the skies.

This single consideration is sufficient to show how completely the daily business of life is affected and controlled by the heavenly bodies. It is they—and not our main-springs, our expansion balances, and our compensating pendulums—which give us our time. To reverse the line of Pope:

“’Tis with our watches as our judgments;—none
Go just alike, but each believes his own.”

But for all the kindreds and tribes and tongues of men—each upon their own meridian—from the Arctic pole to the equator, from the equator to the Antarctic pole, the eternal sun strikes twelve at noon, and the glorious constellations, far up in the everlasting belfries of the skies, chime twelve at midnight;—twelve for the pale student over his flickering lamp; twelve amid the flaming glories of Orion’s belt, if he crosses the meridian at that fated hour; twelve by the weary couch of languishing humanity; twelve in the star-paved courts of the Empyrean; twelve for the heaving tides of the ocean; twelve for the weary arm of labor; twelve for

the toiling brain; twelve for the watching, waking, broken heart; twelve for the meteor which blazes for a moment and expires; twelve for the comet whose period is measured by the centuries; twelve for every substantial, for every imaginary thing, which exists in the sense, the intellect, or the fancy, and which the speech or thought of man, at the given meridian, refers to the lapse of time.

Not only do we resort to the observation of the heavenly bodies for the means of regulating and rectifying our clocks, but the great divisions of day and month and year are derived from the same source. By the constitution of our nature, the elements of our existence are closely connected with celestial times. Partly by his physical organization, partly by the experience of the race from the dawn of creation, man, as he is, and the times and seasons of the heavenly bodies, are part and parcel of one system. The first great division of time, the day-night, for which we have no precise synonym in our language, with its primal alteration of waking and sleeping, of labor and rest, is a vital condition of the existence of such a creature as man. The revolution of the year, with its various incidents of summer and winter, and seed-time and harvest, is not less involved in our social, material, and moral progress. It is true that, at the poles and on the equator, the effects of these revolutions are variously modified or wholly disappear; but as the necessary consequence, human life is extinguished at the poles, and on the equator attains only a languid or feverish development. Those latitudes only in which the great motions and cardinal positions of the earth exert a mean influence, exhibit man in the harmonious expansion of his powers. The lunar

period, which lies at the foundation of the *month*, is less vitally connected with human existence and development; but is proved by the experience of every age and race to be eminently conducive to the progress of civilization and culture.

But indispensable as are these heavenly measures of time to our life and progress, and obvious as are the phenomena on which they rest, yet owing to the circumstances that, in the economy of nature, the day, the month, and the year are not exactly commensurable, some of the most difficult questions in practical astronomy are those by which an accurate division of time, applicable to the various uses of life, is derived from the observation of the heavenly bodies. I have no doubt that, to the Supreme Intelligence which created and rules the universe, there is a harmony hidden to us in the numerical relation to each other of days, months, and years; but in our ignorance of that harmony, their practical adjustment to each other is a work of difficulty. The great embarrassment which attended the reformation of the calendar, after the error of the Julian period had, in the lapse of centuries, reached ten (or rather twelve) days, sufficiently illustrates this remark. It is most true that scientific difficulties did not form the chief obstacle. Having been proposed under the auspices of the Roman pontiff, the Protestant world, for a century and more, rejected the new style. It was in various places the subject of controversy, collision, and bloodshed. It was not adopted in England till nearly two centuries after its introduction at Rome; and in the country of Struve and the Pulkova equatorial, they persist at the present day in adding eleven minutes and twelve seconds to the length of the tropical year.

The second great practical use of an Astronomical Observatory is connected with the science of geography. The first page of the history of our Continent declares this truth. Profound meditation on the sphericity of the earth was one of the main reasons which led Columbus to undertake his momentous voyage; and his thorough acquaintance with the astronomical science of that day was, in his own judgment, what enabled him to overcome the almost innumerable obstacles which attended its prosecution. In return, I find that Copernicus, in the very commencement of his immortal work, *De Revolutionibus Orbium Coelestium*, fol. 2, appeals to the discovery of America as completing the demonstration of the sphericity of the earth. Much of our knowledge of the figure, size, density, and position of the earth, as a member of the solar system, is derived from this science; and it furnishes us the means of performing the most important operations of practical geography. Latitude and longitude, which lie at the basis of all descriptive geography, are determined by observation. No map deserves the name on which the position of important points has not been astronomically determined. Some even of our most important political and administrative arrangements depend upon the coöperation of this science. Among these I may mention the land system of the United States, and the determination of the boundaries of the country. I believe that till it was done by the Federal Government, a uniform system of mathematical survey had never in any country been applied to an extensive territory. Large grants and sales of public land took place before the Revolution, and in the interval between the peace and the adoption of the Constitution; but the limits of these grants and

sales were ascertained by sensible objects, by trees, streams, rocks, hills, and by reference to adjacent portions of territory previously surveyed. The uncertainty of boundaries thus defined was a never-failing source of litigation. Large tracts of land in the Western country, granted by Virginia under this old system of special and local survey, were covered with conflicting claims; and the controversies to which they gave rise formed no small part of the business of the Federal Court after its organization. But the adoption of the present land-system brought order out of chaos. The entire public domain is now scientifically surveyed before it is offered for sale; it is laid off into ranges, townships, sections, and smaller divisions, with unerring accuracy, resting on the foundation of base and meridian lines; and I have been informed that under this system, scarce a case of contested location and boundary has ever presented itself in court. The General Land Office contains maps and plans, in which every quarter-section of the public land is laid down with mathematical precision. The superficies of half a continent is thus transferred in miniature to the bureaus of Washington; while the local Land Offices contain transcripts of these plans, copies of which are furnished to the individual purchaser. When we consider the tide of population annually flowing into the public domain, and the immense importance of its efficient and economical administration, the utility of this application of astronomy will be duly estimated.

I will here venture to repeat an anecdote, which I heard lately from a son of the late Hon. Timothy Pickering. Mr. Octavius Pickering, on behalf of his father, had applied to Mr. David Putnam of Marietta to act as

his legal adviser, with respect to certain land claims in the Virginia Military district, in the State of Ohio. Mr. Putnam declined the agency. He had had much to do with business of that kind, and found it beset with endless litigation. "I have never," he added, "succeeded but in a single case, and that was a location and survey made by General Washington before the Revolution; and I am not acquainted with any surveys, except those made by him, but what have been litigated."

At this moment a most important survey of the coast of the United States is in progress, an operation of the utmost consequence, in reference to the commerce, navigation, and hydrography of the country. The entire work, I need scarce say, is one of practical astronomy.

Astronomical observation furnishes by far the best means of defining the boundaries of States, especially when the lines are of great length and run through unsettled countries. Natural indications, like rivers and mountains, however distinct in appearance, are in practice subject to unavoidable error. By the treaty of 1783, a boundary was established between the United States and Great Britain, depending chiefly on the course of rivers and highlands dividing the waters which flow into the Atlantic Ocean from those which flow into the St. Lawrence. It took twenty years to find out which river was the true St. Croix, that being the starting point. England then having made the extraordinary discovery that the Bay of Fundy is not a part of the Atlantic Ocean, forty years more were passed in the unsuccessful attempt to re-create the highlands which this strange theory had annihilated; and just as the two countries were on the verge of a war, the controversy was settled by compromise. Had the boundary been ac-

curately described by lines of latitude and longitude, no dispute could have arisen. No dispute arose as to the boundary between the United States and Spain, and her successor, Mexico, where it runs through untrodden deserts and over pathless mountains along the forty-second degree of latitude. The identity of rivers may be disputed, as in the case of the St. Croix; the course of mountain chains is too broad for a dividing line; the division of streams, as experience has shown, is uncertain; but a degree of latitude is written on the heavenly sphere, and nothing but an observation is required to read the record.

But scientific elements, like sharp instruments, must be handled with scientific accuracy. A part of our boundary between the British Provinces ran upon the forty-fifth degree of latitude; and about forty years ago an expensive fortress was commenced by the government of the United States, at Rouse's Point, on Lake Champlain, on a spot intended to be just within our limits. When a line came to be more carefully surveyed, the fortress turned out to be on the wrong side of the line; we had been building an expensive fortification for our neighbor. But in the general compromises of the Treaty of Washington by the Webster and Ashburton Treaty in 1842, the fortification was left within our limits.

Errors still more serious had nearly resulted, a few years since, in a war with Mexico. By the treaty of Guadalupe Hidalgo, in 1848, the boundary line between the United States and that country was in part described by reference to the town of El Paso, as laid down on a specified map of the United States, of which a copy was appended to the treaty. This boundary was

to be surveyed and run by a joint commission of men of science. It soon appeared that errors of two or three degrees existed in the projection of the map. Its lines of latitude and longitude did not conform to the topography of the region; so that it became impossible to execute the text of the treaty. The famous Mesilla Valley was a part of the debatable ground; and the sum of ten million dollars, paid to the Mexican Government for that and for an additional strip of territory on the southwest, was the smart-money which expiated the inaccuracy of the map—the necessary result, perhaps, of the want of good materials for its construction. . . .

It would be easy to multiply illustrations in proof of the great practical importance of accurate scientific designations, drawn from astronomical observations, in various relations connected with boundaries, surveys, and other geographical purposes; but I must hasten on.

A third important department, in which the services rendered by astronomy are equally conspicuous. I refer to commerce and navigation. It is mainly owing to the results of astronomical observation, that modern commerce has attained such a vast expansion, compared with that of the ancient world. I have already reminded you that accurate ideas in this respect contributed materially to the conception in the mind of Columbus of his immortal enterprise, and to the practical success with which it was conducted. It was mainly his skill in the use of astronomical instruments—imperfect as they were—which enabled him, in spite of the bewildering variations of the compass, to find his way across the ocean.

With the progress of the true system of the universe toward general adoption, the problem of finding the

longitude at sea presented itself. This was the avowed object of the foundation of the observatory at Greenwich; and no one subject has received more of the attention of astronomers, than those investigations of the lunar theory on which the requisite tables of the navigator are founded. The pathways of the ocean are marked out in the sky above. The eternal lights of the heavens are the only Pharos whose beams never fail, which no tempest can shake from its foundation. Within my recollection, it was deemed a necessary qualification for the master and the mate of a merchant-ship, and even for a prime hand, to be able to "work a lunar," as it was called. The improvements in the chronometer have in practice, to a great extent, superseded this laborious operation; but observation remains, and unquestionably will forever remain, the only dependence for ascertaining the ship's time and deducing the longitude from the comparison of that time with the chronometer.

It may, perhaps, be thought that astronomical science is brought already to such a state of perfection that nothing more is to be desired, or, at least, that nothing more is attainable, in reference to such practicable applications as I have described. This, however, is an idea which generous minds will reject, in this, as in every other department of human knowledge. In astronomy, as in everything else, the discoveries already made, theoretical or practical, instead of exhausting the science, or putting a limit to its advancement, do but furnish the means and instruments of further progress. I have no doubt we live on the verge of discoveries and inventions, in every department, as brilliant as any that have ever been made; that there are new truths, new

facts, ready to start into recognition on every side; and it seems to me there never was an age, since the dawn of time, when men ought to be less disposed to rest satisfied with the progress already made, than the age in which we live; for there never was an age more distinguished for ingenious research, for novel result, and bold generalization.

That no further improvement is desirable in the means and methods of ascertaining the ship's place at sea, no one, I think, will from experience be disposed to assert. The last time I crossed the Atlantic, I walked the quarterdeck with the officer in charge of the noble vessel, on one occasion, when we were driving along before a leading breeze and under a head of steam, beneath a starless sky at midnight, at the rate certainly of ten or eleven miles an hour. There is something sublime, but approaching the terrible, in such a scene;—the rayless gloom, the midnight chill,—the awful swell of the deep,—the dismal moan of the wind through the rigging, the all but volcanic fires within the hold of the ship. I scarce know an occasion in ordinary life in which a reflecting mind feels more keenly its hopeless dependence on irrational forces beyond its own control. I asked my companion how nearly he could determine his ship's place at sea under favorable circumstances. "Theoretically," he answered, "I think, within a mile;—practically and usually within three or four." My next question was, "How near do you think we may be to Cape Race?" (that dangerous headland which pushes its ironbound unlighted bastions from the shore of Newfoundland far into the Atlantic,—first landfall to the homeward-bound American vessel). "We must," said he, "by our last observations and reckon-

ing, be within three or four miles of Cape Race." A comparison of the two remarks, under the circumstances in which we were placed at the moment, brought my mind to the conclusion, that it is greatly to be wished that the means should be discovered of finding the ship's place more accurately, or that navigators would give Cape Race a little wider berth. But I do not remember that one of the steam packets between England and America was ever lost on that formidable point.

It appears to me by no means unlikely that, with the improvement of instrumental power, and of the means of ascertaining the ship's time with exactness, as great an advance beyond the present state of art and science in finding a ship's place at sea may take place, as was effected by the invention of the reflecting quadrant, the calculation of lunar tables, and the improved construction of chronometers. . . .

Whatever advances may be made in astronomical science, theoretical or applied, I am strongly inclined to think that they will be made in connection with an increased command of instrumental power. The natural order in which the human mind proceeds in the acquisition of astronomical knowledge is minute and accurate observation of the phenomena of the heavens, the skilful discussion and analysis of these observations, and sound philosophy in generalizing the results.

In pursuing this course, however, a difficulty presents itself, which for ages proved insuperable—and which, to the same extent, has existed in no other science, viz.: that all the leading phenomena are in their appearance delusive. It is, indeed, true that in all sciences superficial observation can only lead, except by chance,

to superficial knowledge; but I know of no branch in which, to the same degree as in astronomy, the great leading phenomena are the reverse of true; while they yet appeal so strongly to the senses, that men who could foretell eclipses, and who discovered the procession of the equinoxes, still believed that the earth was at rest in the center of the universe, and that all the host of heaven performed a daily revolution about it as a center.

It usually happens in scientific progress, that, when a great fact is at length discovered, it approves itself at once to all competent judges. It furnishes a solution to so many problems, and harmonizes with so many other facts,—that all the other *data*, as it were, crystallize at once about it. In modern times, we have often witnessed such an impatience, so to say, of great truths, to be discovered, that it has frequently happened that they have been found out simultaneously by more than one individual; and a disputed question of priority is an event of very common occurrence. Not so with the true theory of the heavens. So complete is the deception practised on the senses, that it failed more than once to yield to the suggestion of the truth; and it was only when the visual organs were armed with an almost preternatural instrumental power, that the great fact found admission to the human mind.

It is supposed that in the very dawn of the science, Pythagoras or his disciples explained the apparent motion of the heavenly bodies about the earth by the diurnal revolution of the earth on its axis. But this theory, though bearing so deeply impressed upon it the great seal of truth, *simplicity*, was in such glaring contrast with the evidence of the senses that it failed of acceptance in antiquity or the Middle Ages. It found no favor with



INTERIOR OF THE 90-FOOT DOME OF YERKES OBSERVATORY

minds like those of Aristotle, Archimedes, Hipparchus, Ptolemy, or any of the acute and learned Arabians or mediaeval astronomers. All their ingenuity and all their mathematical skill were exhausted in the development of a wonderfully complicated and ingenious, but erroneous history. The great master truth, rejected for its simplicity, lay disregarded at their feet.

At the second dawn of science, the great fact again beamed into the mind of Copernicus. Now, at least, in that glorious age which witnessed the invention of printing, the great mechanical engine of intellectual progress, and the discovery of America, we may expect that this long-hidden revelation, a second time proclaimed, will command the assent of mankind. But the sensible phenomena were still too strong for the theory; the glorious delusion of the rising and the setting sun could not be overcome. Tycho Brahe furnished his Observatory with instruments superior in number and quality to all that had been collected before; but the great instrument of discovery which, by augmenting the optic power of the eye, enables it to penetrate beyond the apparent phenomena, and to discern the true constitution of the heavenly bodies, was wanting at Uranienburg. The observations of Tycho as discussed by Kepler, conducted that most fervid, powerful, and sagacious mind to the discovery of some of the most important laws of the celestial motions; but it was not till Galileo, at Florence, had pointed his telescope to the sky, that the Copernican system could be said to be firmly established in the scientific world.

On this great name, my friends, assembled as we are to dedicate a temple to instrumental astronomy, we may well pause for a moment.

There is much in every way, in the city of Florence, to excite the curiosity, to kindle the imagination, and to gratify the taste. Sheltered on the north by the vine-clad hills of Fiesole, whose cyclopean walls carry back the antiquary to ages before the Roman, before the Etruscan power, the flowery city (Fiorenza) covers the sunny banks of the Arno with its stately palaces. Dark and frowning piles of mediaeval structure; a majestic dome, the prototype of St. Peter's; basilicas which enshrine the ashes of some of the mightiest of the dead; the stone where Dante stood to gaze on the Campanile; the house of Michael Angelo, still occupied by a descendant of his lineage and name, his hammer, his chisel, his dividers, his manuscript poems, all as if he had left them but yesterday; airy bridges, which seem not so much to rest on the earth as to hover over the waters they span; the loveliest creations of ancient art, rescued from the grave of ages again to enchant the world; the breathing marbles of Michael Angelo, the glowing canvases of Raphael and Titian, museums filled with medals and coins of every age, from Cyrus the Younger, and gems and amulets and vases from the sepulchers of Egyptian Pharaohs coeval with Joseph, and Etruscan Lucumons that swayed Italy before the Romans,—libraries stored with the choicest texts of ancient literature,—gardens of rose, and orange, and pomegranate, and myrtle,—the very air you breathe languid with music and perfume;—such is Florence. But among all its fascinations, addressed to the sense, the memory, and the heart, there was none to which I more frequently gave a meditative hour during a year's residence, than to the spot where Galileo Galilei sleeps beneath the marble floor of Santa Croce; no building on which I gazed with greater rev-

erence, than I did upon the modest mansion at Arcetri, villa at once and prison, in which that venerable sage, by command of the Inquisition, passed the sad closing years of his life. The beloved daughter on whom he had depended to smooth his passage to the grave, laid there before him; the eyes with which he had discovered worlds before unknown, quenched in blindness. That was the house, "where," says Milton (another of those of whom the world was not worthy), "I found and visited the famous Galileo, grown old—a prisoner to the Inquisition, for thinking on astronomy otherwise than as the Dominican and Franciscan licensers thought." Great heavens! what a tribunal, what a culprit, what a crime! Let us thank God, my friends, that we live in the nineteenth century. Of all the wonders of the ancient and modern art, statues and paintings, and jewels and manuscripts,—the admiration and the delight of ages,—there was nothing which I beheld with more affectionate awe than that poor, rough tube, a few feet in length,—the work of his own hands,—that very "optic glass," through which the

"Tuscan Artist viewed the moon,
At evening, from the top of Fiesolè
Or in Valdarno, to descry new lands,
Rivers, or mountains, in her spotty globe";

that poor little spy-glass (for it is scarcely more) through which the human eye first distinctly beheld the surface of the moon—first discovered the phases of Venus, the satellites of Jupiter, and the seeming handles of Saturn—first penetrated the dusky depths of the heavens—first pierced the clouds of visual error, which,

from the creation of the world, involved the system of the Universe.

There are occasions in life in which a great mind lives years of rapt enjoyment in a moment. I can fancy the emotions of Galileo, when, first raising the newly-constructed telescope to the heavens, he saw fulfilled the grand prophecy of Copernicus, and beheld the planet Venus, crescent like the moon. It was such another moment as that when the immortal printers of Mentz and Strasburg received the first copy of the Bible into their hands, the work of their divine art; like that when Columbus, through the gray dawn of the 12th of October, 1492 (Copernicus, at the age of eighteen, was then a student at Cracow), beheld the shores of San Salvador; like that when the law of gravitation first revealed itself to the intellect of Newton; like that when Franklin saw by the stiffening fibers of the hempen cord of his kite, that he held the lightning in his grasp; like that when Leverrier received back from Berlin the tidings that the predicted planet was found.

Yes, noble Galileo, thou art right, "It does move." Bigots may make thee recant it; but it moves, nevertheless. Yes, the earth moves, and the planets move, and the mighty waters move, and the great sweeping tides of air move, and the empires of men move, and the world of thought moves, ever onward and upward to higher facts and bolder theories. The Inquisition may seal thy lips, but they can no more stop the progress of the great truth propounded by Copernicus, and demonstrated by thee, than they can stop the revolving earth.

Close now, venerable sage, that sightless, tearful eye; it has seen what man never saw before—it has seen enough. Hang up that poor little spy-glass—it has

done its work. Not Herschel nor Rosse have, comparatively, done more. Franciscans and Dominicans deride thy discoveries now; but the time will come when, from two hundred observatories in Europe and America, the glorious artillery of science shall nightly assault the skies, but they shall gain no conquest in those glittering fields before which thine shall be forgotten. Rest in peace, great Columbus of the heavens—like him scorned; persecuted, broken-hearted!—in other ages, in distant hemispheres, when the votaries of science, with solemn acts of consecration, shall dedicate their stately edifices to the cause of knowledge and truth, thy name shall be mentioned with honor.

—EDWARD EVERETT (Adapted).

“ MARCHING ON A STAR ”

I HAPPENED some time ago to lecture to a number of army officers on “ The Use of the Stars in Night-Marches.” They appeared to find my notes of interest and service, and this suggested to me that perhaps a small pocketbook devoted to a practical consideration of the matter might be found useful by soldiers; possibly, too, by other landsmen who are interested in the stars, or may have occasion to walk or ride by night through unfamiliar country. Furthermore, the fact that the results arrived at are obtained rather by observation and practice than by mathematical calculation should render the work well adapted to the needs and tastes of the Boy Scouts.

The first question, naturally, is: “ What can a landman get by the use of the stars? ” To the seaman, of course, they may be of great assistance; and a good ob-

server under favorable conditions is able by their aid to convert his general idea of the position of his ship into one that is not more than a mile or so incorrect. But it by no means follows that the traveler by night on land will be able to, or indeed wants to, make the same use of the stars. For consider; the navigator has at his command, to assist him, chronometer, charts, sextant, nautical almanacs, and figure tables: the night-marcher *may* have all these, and an artificial horizon as well, but except on a scientific expedition he is very unlikely to. Again, the former takes and works out his observations without any waste of time to the ship and with light and comfort; the latter may have to stop to do so and thus lose time, and the conditions under which he is likely to be working tend to introduce errors.

Position, then, to the landsman, is (even if desirable) quite unfeasible; what the stars give him is *direction*. And first let us be quite clear what we mean when we speak of the stars giving "direction." Not of course that they act as a kind of wayside finger-post pointing "X—12 miles," and so forth; this is more than can reasonably be expected; and if a wanderer is so completely lost that he has no notion whether his home lies north or south or east or west, all the star-lore in the world will do no more for him than enable him to choose some direction and hold to it. But this it will do. It will, in the simplest and best case, give us the N. and S. points, and we must make what use we can of that knowledge. Perhaps it has been possible to work out the bearing of destination from starting-point to be (say) N. 65 W. We lay off this angle on a piece of paper or cardboard, and pointing the one line at the ascertained N. point proceed to march along the other.

The best direction to be obtained is this N. and S. line, but it is not the only possible one. It may be possible and convenient to do what is known as "marching on a star." That is to say, a certain star is selected beforehand, and its bearings at given intervals, say of half an hour, are worked out in advance and noted down. If then the bearing of our destination is known, we have only to keep the right direction angles with the star at the right times to be following the line we require. The ways in which the necessary data can be obtained are clearly set forth in Major Tilney's "Rapid Night Marching Made Easy," and for a predetermined and properly planned and equipped night march this plan is satisfactory enough.

—R. WEATHERHEAD: *The Star Pocket-Book*.

THE FIRST TELESCOPE

IN the present treatise I set forth some matters of great interest for all observers of natural phenomena to look at and consider. They are of great interest, I think, first, from their intrinsic excellence; secondly, from their absolute novelty; and lastly, also on account of the instrument by the aid of which they have been presented to my apprehension.

The number of the Fixed Stars which observers have been able to see without artificial powers of sight up to this day can be counted. It is, therefore, decidedly a great feat to add to their number, and to set distinctly before the eyes other stars in myriads, which have never been seen before, and which surpass the old, previously known, stars in number more than ten times.

Again, it is a most beautiful and delightful sight to behold the body of the Moon, which is distant from us nearly sixty *semi*-diameters of the Earth, as near as if it was at a distance of only two of the same measures; so that the diameter of this same Moon appears about thirty times larger, its surface about nine hundred times, and its solid mass nearly twenty-seven thousand times larger than when it is viewed only with the naked eye; and consequently any one may know with the certainty that is due to the use of our senses, that the Moon certainly does not possess a smooth and polished surface, but one rough and uneven, and, just like the face of the Earth itself, is everywhere full of vast protuberances, deep chasms, and sinuosities.

Then, to have got rid of disputes about the Galaxy or Milky Way, and to have made its nature clear to the very senses, not to say to the understanding, seems by no means a matter which ought to be considered of slight importance. In addition to this, to point out, as with one's finger, the nature of these stars which every one of the astronomers up to this time has called *nebulous*, and to demonstrate that it is very different from what has hitherto been believed, will be pleasant, and very fine. But that which will excite the greatest astonishment by far, and which, indeed, especially moved me to call the attention of all astronomers and philosophers, is this, namely, that I have discovered four planets, neither known nor observed by any one of the astronomers before my time, which have their orbits round a certain bright star, one of those previously known, like Venus and Mercury round the Sun, and are sometimes in front of it, sometimes behind it, though they never depart from it beyond certain limits.

All which facts were discovered and observed a few days ago by the help of a telescope devised by me, through God's grace first enlightening my mind.

Perhaps other discoveries still more excellent will be made from time to time by me or by other observers, with the assistance of a similar instrument, so I will first briefly record its shape and preparation, as well as the occasion of its being devised, and then I will give an account of the observations made by me.

About ten months ago a report reached my ears that a Dutchman had constructed a telescope, by the aid of which visible objects, although at a great distance from the eye of the observer, were seen distinctly as if near; and some proofs of its most wonderful performances were reported, which some gave credence to, but others contradicted. A few days after, I received confirmation of the report in a letter written from Paris by a noble Frenchman, Jaques Badovere, which finally determined me to give myself up first to inquire into the principle of the telescope, and then to consider the means by which I might compass the invention of a similar instrument, which a little while after I succeeded in doing, through deep study of the theory of Refraction; and I prepared a tube, at first of lead, in the ends of which I fitted two glass lenses, both plane on one side, but on the other side one spherically convex, and the other concave. Then bringing my eye to the concave lens I saw objects satisfactorily large and near, for they appeared one-third of the distance off, and nine times larger than when they are seen with the natural eye alone. I shortly afterwards constructed another telescope with more nicety, which magnified objects more than sixty times. At length, by sparing neither labor

nor expense, I succeeded in constructing for myself an instrument so superior that objects seen through it appear magnified nearly a thousand times, and more than thirty times nearer than if viewed by the natural powers of sight alone.

It would be altogether a waste of time to enumerate the number and importance of the benefits which this instrument may be expected to confer, when used by land or sea. But without paying attention to its use for terrestrial objects, I betook myself to observations of the heavenly bodies; and first of all, I viewed the Moon as near as if it was scarcely two *semi-diameters* of the Earth distant. After the Moon, I frequently observed other heavenly bodies, both fixed stars and planets, with incredible delight. . . .

Let me speak first of the surface of the Moon, which is turned towards us. For the sake of being understood more easily, I distinguish two parts in it, which I call respectively the brighter and darker. The brighter part seems to surround and pervade the whole hemisphere; but the darker part, like a sort of cloud, discolours the Moon's surface and makes it appear covered with spots. Now these spots, as they are somewhat dark and of considerable size, are plain to every one, and every age has seen them, wherefore I shall call them *great* or *ancient* spots, to distinguish them from other spots, smaller in size, but so thickly scattered that they sprinkle the whole surface of the Moon, but especially the brighter portion of it. These spots have never been observed by any one before me; and from my observations of them, often repeated, I have been led to that opinion which I have expressed, namely, that I feel sure that the surface of the Moon is not perfectly smooth, free

from inequalities and exactly spherical, as a large school of philosophers considers with regard to the Moon and the other heavenly bodies, but that, on the contrary, it is full of inequalities, uneven, full of hollows and protuberances, just like the surface of the Earth itself, which is varied everywhere by lofty mountains and deep valleys. . . .

There is one other point which I must on no account forget, which I have noticed and rather wondered at. It is this:—The middle of the Moon, as it seems, is occupied by a certain cavity larger than all the rest, and in shape perfectly round. I have looked at this depression near both the first and third quarters. . . . It produces the same appearance as to effects of light and shade as a tract like Bohemia would produce on the Earth, if it were shut in on all sides by very lofty mountains arranged on the circumference of a perfect circle; for the tract in the Moon is walled in with peaks of such enormous height that the furthest side adjacent to the dark portion of the Moon is seen bathed in sunlight before the boundary between light and shade reaches half-way across the circular space. But, according to the characteristic property of the rest of the spots, the shaded portion of this, too, faces the Sun, and the bright part is towards the dark side of the Moon, which for the third time I advise to be carefully noticed as a most solid proof of the ruggednesses and unevennesses spread over the whole of the bright region of the Moon. Of these spots, moreover, the darkest are always those which are near to the boundary-line between the light and the shadow, but those further off appear both smaller in size and less decidedly dark; so that at length, when the Moon at opposition becomes full, the darkness

of the cavities differs from the brightness of the prominences with a subdued and very slight difference. . . .

Hitherto I have spoken of the observations which I have made concerning the Moon's body; now I will briefly announce the phenomena which have been, as yet, seen by me with reference to the Fixed Stars. And first of all, the following fact is worthy of consideration: the stars, fixed as well as erratic, when seen with a telescope, by no means appear to be increased in magnitude in the same proportion as other objects, and the Moon herself, gain increase of size; but in the case of the stars such increase appears much less, so that you may consider that a telescope, which (for the sake of illustration) is powerful enough to magnify other objects a hundred times, will scarcely render the stars magnified four or five times. But the reason of this is as follows: when stars are viewed with our natural eyesight they do not present themselves to us of their bare, real size, but beaming with a certain vividness, and fringed with sparkling rays, especially when the night is far advanced; and from this circumstance they appear much larger than they would if they were stripped of those adventitious fringes, for the angle which they subtend at the eye is determined not by the primary disk of the star, but by the brightness which so widely surrounds it. Perhaps you will understand this most clearly from the well-known circumstance that when stars rise just at sunset, in the beginning of twilight, they appear very small, although they may be stars of the first magnitude; and even the planet Venus itself, on any occasion when it may present itself to view in broad daylight, is so small to see that it scarcely seems to equal a star of the last magnitude. It is different in the case of other ob-

jects, and even of the Moon, which, whether viewed in the light of midday or in the depth of night, always appear of the same size. We conclude therefore that the stars are seen at midnight in uncurtailed glory, but their fringes are of such a nature that the daylight can cut them off, and not only daylight, but any slight cloud which may be interposed between a star and the eye of the observer. A dark veil or colored glass has the same effect, for, upon placing them before the eye between it and the stars, all the blaze that surrounds them leaves them at once. A telescope also accomplishes the same result, for it removes from the stars their adventitious and accidental splendors before it enlarges their true disks (if, indeed, they are of that shape), and so they seem less magnified than other objects, for a star of the fifth or sixth magnitude seen through a telescope is shown as of the first magnitude only.

The difference between the appearance of the planets and the fixed stars seems also deserving of notice. The planets present their disks perfectly round, just as if described with a pair of compasses, and appear as so many little moons, completely illuminated and of a globular shape; but the fixed stars do not look to the naked eye bounded by a circular circumference, but rather like blazes of light, shooting out beams on all sides and very sparkling, and with a telescope they appear of the same shape as when they are viewed by simply looking at them, but so much larger that a star of the fifth or sixth magnitude seems to equal Sirius, the largest of all the fixed stars.

But beyond the stars of the sixth magnitude you will behold through the telescope a host of other stars, which escape the unassisted sight, so numerous as to be

almost beyond belief, for you may see more than six other differences of magnitude, and the largest of these, which I may call stars of the seventh magnitude, or of the first magnitude of invisible stars, appear with the aid of the telescope larger and brighter than stars of the second magnitude seen with the unassisted sight. . . .

The next object which I have observed is the essence or substance of the Milky Way. By the aid of a telescope any one may behold this in a manner which so distinctly appeals to the senses that all the disputes which have tormented philosophers through so many ages are exploded at once by the irrefragable evidence of our eyes, and we are freed from wordy disputes upon this subject, for the Galaxy is nothing else but a mass of innumerable stars planted together in clusters. Upon whatever part of it you direct the telescope, straightway a vast crowd of stars presents itself to view; many of them are tolerably large and extremely bright, but the number of small ones is quite beyond determination.

And whereas that milky brightness, like the brightness of a white cloud, is not only to be seen in the Milky Way, but several spots of a similar color shine faintly here and there in the heavens, if you turn the telescope upon any of them you will find a cluster of stars packed close together. Further,—and you will be more surprised at this,—the stars which have been called by every one of the astronomers up to this day *nebulous*, are groups of small stars set thick together in a wonderful way, and although each one of them, on account of its smallness, or its immense distance from us, escapes our sight, from the commingling of their rays there arises that bright-

ness which has hitherto been believed to be the denser part of the heavens, able to reflect the rays of the stars or the Sun. . . .

I have now finished my brief account of the observations which I have thus far made with regard to the Moon, the Fixed Stars, and the Galaxy. There remains the matter, which seems to me to deserve to be considered the most important in this work, namely, that I should disclose and publish to the world the occasion of discovering and observing four PLANETS, never seen from the very beginning of the world up to our own times, their positions, and the observations made during the last two months about their movements and their changes of magnitude; and I summon all astronomers to apply themselves to examine and determine their periodic times, which it has not been permitted me to achieve up to this day, owing to the restriction of my time. I give them warning, however, again, so that they may not approach such an inquiry to no purpose, that they will want a very accurate telescope, and such as I have described in the beginning of this account.

On the 7th day of January in the present year, 1610, in the first hour of the following night, when I was viewing the constellations of the heavens through a telescope, the planet Jupiter presented itself to my view, and as I had prepared for myself a very excellent instrument, I noticed a circumstance which I had never been able to notice before, owing to want of power in my other telescope, namely, that three little stars, small but very bright, were near the planet; and although I believed them to belong to the number of fixed stars, yet they made me somewhat wonder, because they seemed to be arranged exactly in a straight line, parallel to the

ecliptic, and to be brighter than the rest of the stars, equal to them in magnitude.

On the east side there were two stars, and a single one on the west. The star which was furthest towards the east, and the western star, appeared rather larger than the third.

I scarcely troubled at all about the distance between them and Jupiter, for, as I have already said, at first I believed them to be fixed stars; but when, on January 8th, led by some fatality, I turned again to look at the same part of the heavens, I found a very different state of things, for there were three little stars all west of Jupiter, and nearer together than on the previous night, and they were separated from one another by equal intervals.

At this point, although I had not turned my thoughts at all upon the approximation of the stars to one another, yet my surprise began to be excited, how Jupiter could one day be found to the east of all the aforesaid fixed stars, when the day before it had been west of two of them; and forthwith I became afraid lest the planet might have moved differently from the calculation of astronomers, and so had passed those stars by its own proper motion. I, therefore, waited for the next night with the most intense longing, but I was disappointed of my hope, for the sky was covered with clouds in every direction.

But on January 10th the stars appeared in the following position with regard to Jupiter; there were two only, and both on the east side of Jupiter, the third, as I thought, being hidden by the planet. They were situated just as before, exactly in the same straight line with Jupiter, and along the Zodiac.

When I had seen these phenomena, as I knew that corresponding changes of position could not by any means belong to Jupiter, and as, moreover, I perceived that the stars which I saw had always been the same, for there were no others either in front or behind, within a great distance, along the Zodiac,—at length changing from doubt into surprise, I discovered that the interchange of position which I saw belonged not to Jupiter, but to the stars to which my attention had been drawn, and I thought, therefore, that they ought to be observed henceforward with more attention and precision.

—GALILEO GALILEI: *The Astronomical Messenger*, translated by E. S. Carlos.

APPENDIX

THE MAGNITUDES

By the magnitude of a star we mean its apparent brightness, and not its size or its nearness to the earth. Alpha Centauri, the fixed star nearest to us, is surpassed in brightness by several stars. When the stars were first classed into magnitudes, our fine astronomical instruments had not been invented, and all the visible stars, from the brilliant Sirius to the tiniest sixth-magnitude stars, were arranged in six magnitudes. It was not possible with the naked eye to make finer distinctions. Now we can make much more accurate classifications. Each magnitude has only $\frac{2}{5}$ as much light as the magnitude above it—that is, a star of standard third magnitude sends us only $\frac{2}{5}$ as much light as one of standard second magnitude. The gradation of light between the different magnitudes is expressed by the tenth of decimal fractions. The stars within $\frac{1}{10}$ of a magnitude are included within this magnitude. Aldebaran is 1.0, a standard first-magnitude star. Deneb is 1.4, still a first-magnitude star. All stars from 1.6 to 2.5 are second-magnitude stars. This is the case with all the magnitudes excepting the first. It was found that nine of the twenty first-magnitude stars were brighter than 1.0, reaching through nearly two magnitudes of brightness. So, although we speak of all of them as first-magnitude stars, those from 1.5 to 0.6 are first magnitude, those 0.5 to —0.5 are designated zero magnitudes, and all brighter are called stars brighter than zero magnitude. By making a list of the magnitude numbers and the decimals between them, you can easily draw lines at the points where one magnitude merges into another, and this will help you to understand.

There are only two stars brighter than zero magnitude, Canopus—0.8 and Sirius—1.4. Thus Sirius is half a magnitude brighter than any other star, and is nearly two magnitudes brighter than Capella, one of the three brightest stars in the northern hemisphere. Four of the first stars—Canopus, Alpha Centauri, Beta Centauri, and Alpha Crucis—are too far to the south to be seen from our northern latitudes, and are not on our northern charts.

The following list will give you the magnitudes of the first-magnitude stars as compiled by the journal *Popular Astronomy* in its star charts.

STARS OF THE FIRST MAGNITUDE

A. STARS BRIGHTER THAN 0 MAGNITUDE		C. STARS OF 1ST MAGNITUDE	
NAME	MAGNITUDE	NAME	MAGNITUDE
α Canis Majoris (<i>Sirius</i>)	1.4	α Tauri (<i>Aldebaran</i>)	1.0
α Argi (<i>Canopus</i>)	— 0.8	α Orionis (<i>Betelgeuse</i>)	0.9
B. STARS OF 0 MAGNITUDE		β Geminorum (<i>Pollux</i>)	1.2
		α Leonis (<i>Regulus</i>)	1.3
α Eridani (<i>Achernar</i>)	0.4	α Crucis	1.0
α Aurigae (<i>Capella</i>)	0.1	α Virginis (<i>Spica</i>)	1.1
β Orionis (<i>Rigel</i>)	0.3	β Centauri	0.7
α Canis Minoris		α Scorpii (<i>Antares</i>)	1.2
(<i>Procyon</i>)	0.5	α Aquilae (<i>Altair</i>)	0.9
α Bootis (<i>Arcturus</i>)	0.2	α Cygni (<i>Deneb</i> or <i>Aried</i>)	1.4
α Centauri	0.2	α Piscis Australis	
α Lyrae (<i>Vega</i>)	0.2	(<i>Fomalhaut</i>)	1.3

STAR NAMES

The people of ancient times gave names to almost all the brighter stars. There is no first magnitude star in the northern

hemisphere that does not have an individual name. There are three first-magnitude stars far south that do not have individual names, but they were probably not known to the ancients. Each name is supposed to have had in the beginning a special significance, and some of them still retain their meaning; Denebola, for example, means the tail of the Lion.

Early in the seventeenth century a plan was adopted of designating the stars in each constellation by using the Genitive form of the Latin name of the constellation as a family name, and the letters of the Greek alphabet for the individual names. Thus Vega in Lyra is Alpha Lyrae. The Greek letters are assigned to the stars almost always according to the relative magnitudes of the stars in a constellation. One of the few exceptions to this rule is in Gemini. The Twin Pollux is brighter than Castor, yet Castor is called Alpha Geminorum, and Pollux Beta Geminorum. The brightness of Castor is diminishing as it recedes from us; it is possible that when they were given their Greek letter "Christian names," Castor may have been the brighter.

Sometimes clusters of stars inside a constellation have names; as the Pleiades and Hyades in Taurus, and the Praesepe in Cancer.

The following list gives the names of about thirty of the best-known stars and the astronomical designation of each.

INDIVIDUAL STAR NAMES

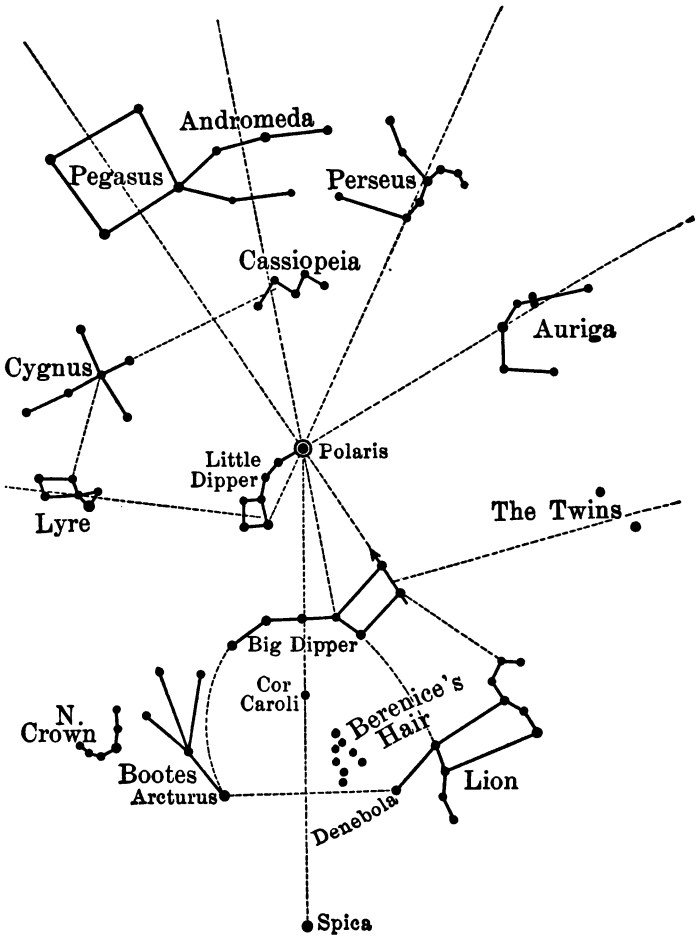
NAME	OTHER DESIGNATION
Albireo	β Cygni
Alcor	g Ursae Majoris
Aldebaran	α Tauri
Algenib	γ Pegasi
Algol	β Persei
Alpheratz	α Andromedae

Altair	α Aquilae
Antares	α Scorpii
Arcturus	α Bootis
Bellatrix	γ Orionis
Betelgeuse	α Orionis
Canopus	α Argi
Capella	α Aurigae
Castor	α Geminorum
Cynosura	α Ursae Minoris
Deneb	α Cygni
Denebola	β Leonis
Dubhe	α Ursae Majoris
Fomalhaut	α Piscis Australis
Hyades	Group in Taurus
Markab	α Pegasi
Mizar	ζ Ursae Majoris
El Nath	β Tauri
Pleiades	Group in Taurus
Aleyone	η Tauri
Polaris	α Ursae Minoris
Pollux	β Geminorum
Praesepe	Cluster in Cancer
Procyon	α Canis Minoris
Regulus	α Leonis
Rigel	β Orionis
Sirius	α Canis Majoris
Spica	α Virginis
Vega	α Lyrae

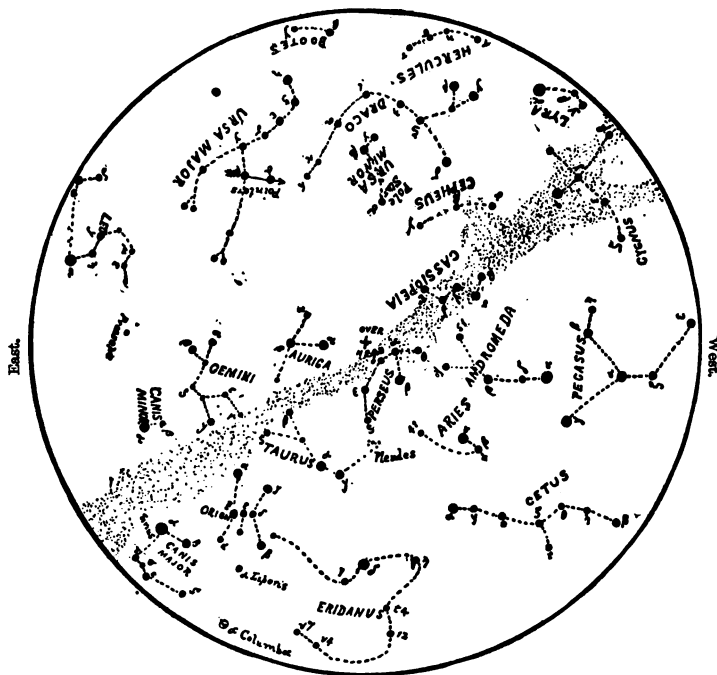
GREEK ALPHABET

Letters	Names	Letters	Names	Letters	Names
<i>A</i> α	Alpha	<i>I</i> ι	Iota	<i>P</i> ρ	Rho
<i>B</i> β	Beta	<i>K</i> κ	Kappa	Σ σ ς	Sigma
<i>\Gamma</i> γ	Gamma	<i>\Lambda</i> λ	Lambda	<i>T</i> τ	Tau
<i>\Delta</i> δ	Delta	<i>M</i> μ	Mu	<i>\Upsilon</i> υ	Upsilon
<i>E</i> ϵ	Epsilon	<i>N</i> ν	Nu	Φ ϕ	Phi
<i>Z</i> ζ	Zeta	Ξ ξ	Xi	<i>X</i> χ	Chi
<i>H</i> η	Eta	<i>O</i> o	Omicron	Ψ ψ	Psi
Θ θ	Theta	<i>\Pi</i> π	Pi	Ω ω	Omega

COMPOUND REFERENCE CHART



MAP I.
North.



South.
FIG. 214.

The sky on November 22, at 12 o'clock P.M.
 December 6, at 11 o'clock P.M.
 December 21, at 10 o'clock P.M.
 January 5, at 9 o'clock P.M.
 January 20, at 8 o'clock P.M.

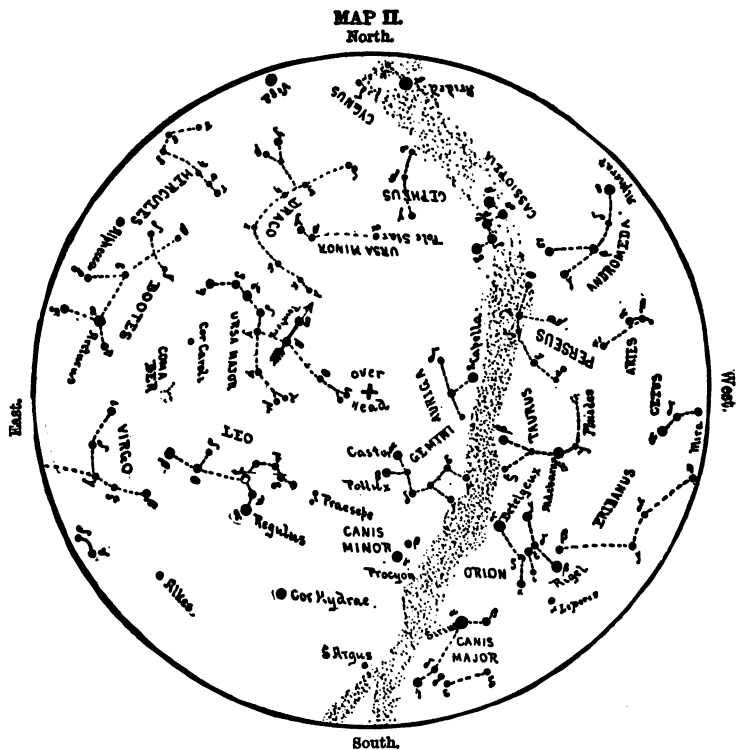
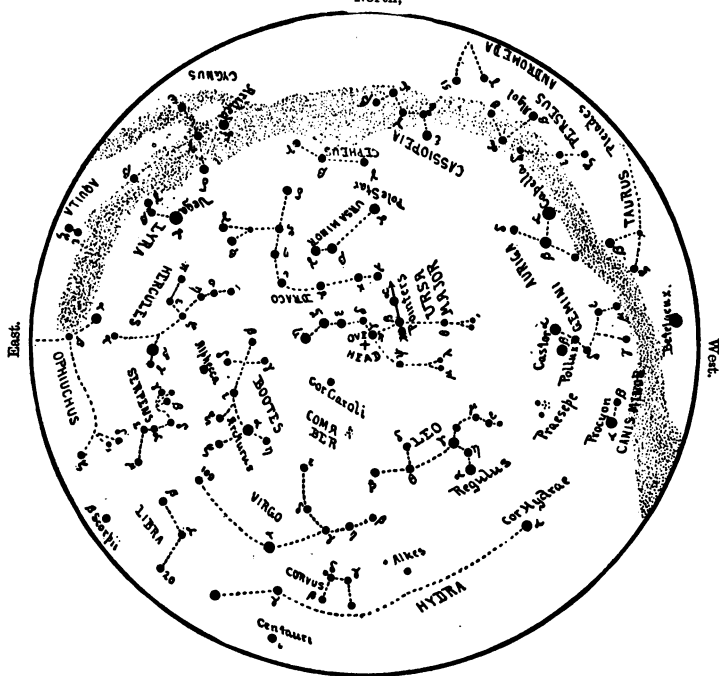


FIG. 215.

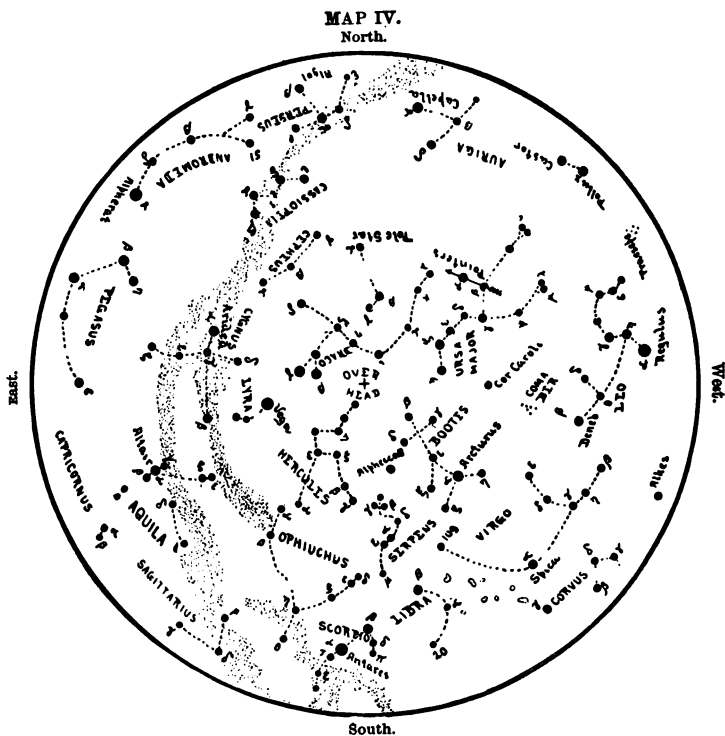
The sky on January 20, at 12 o'clock P.M.
 February 4, at 11 o'clock P.M.
 February 19, at 10 o'clock P.M.
 March 6, at 9 o'clock P.M.
 March 21, at 8 o'clock P.M.

MAP III.
North,



South.
FIG. 216.

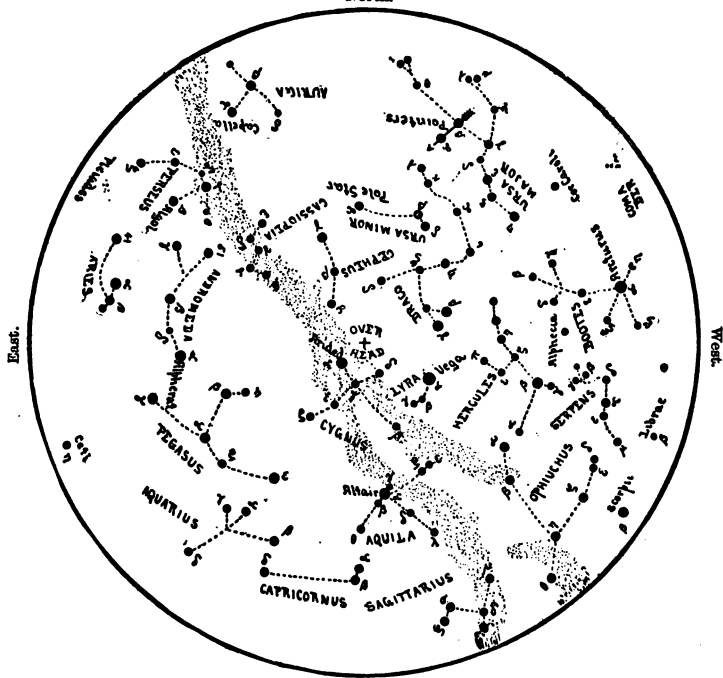
The sky on March 21, at 12 o'clock P.M.
 April 5, at 11 o'clock P.M.
 April 20, at 10 o'clock P.M.
 May 5, at 9 o'clock P.M.
 May 21, at 8 o'clock P.M.

**FIG. 217.**

The sky on May 21, at 12 o'clock P.M.
 June 5, at 11 o'clock P.M.
 June 21, at 10 o'clock P.M.
 July 7, at 9 o'clock P.M.
 July 22, at 8 o'clock P.M.

MAP V.

North.



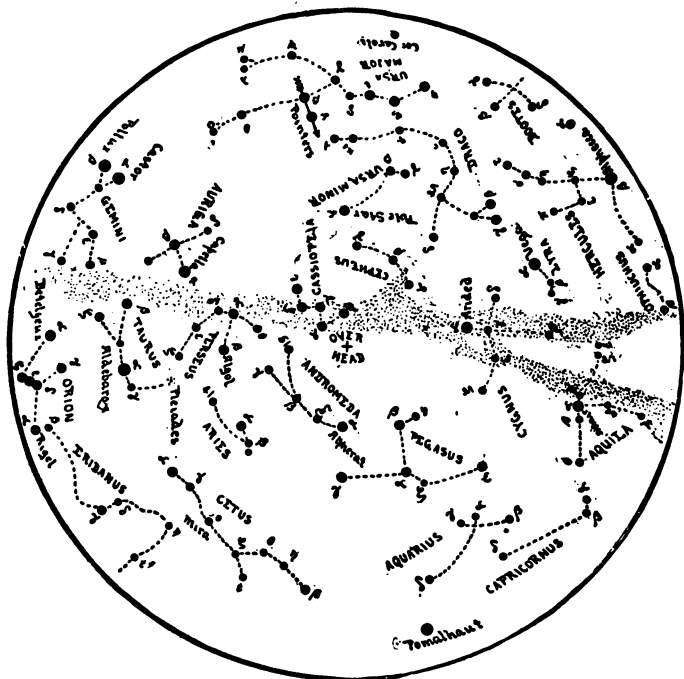
South.

FIG. 218.

The sky on July 22, at 12 o'clock P.M.
August 7, at 11 o'clock P.M.
August 23, at 10 o'clock P.M.
September 8, at 9 o'clock P.M.
September 23, at 8 o'clock P.M.

MAP VI.

North.



South.

F.c. 219.

The sky on September 23, at 12 o'clock P.M.
 October 8, at 11 o'clock P.M.
 October 23, at 10 o'clock P.M.
 November 7, at 9 o'clock P.M.
 November 22, at 8 o'clock P.M.

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